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CLINICAL LESSONS

ON

NERVOUS DISEASES

BY

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LEA BROTHERS & CO.
PHILADELPHIA AND NEW YORK

1897

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DORNAN, PRINTER.

PREFACE.

I TAKE this opportunity to thank my clinical aids, Drs. John Madison Taylor, C. W. Burr, Guy Hinsdale, John K. Mitchell, John H. Rhein, F. S. Pearce, A. A. Eschner, and F. W. Talley for the careful personal study given to the cases in this little book and for whatever consequent value they may have. I am also indebted to Dr. John Madison Taylor for the representations of erythromelalgia and for the other illustrative drawings.

S. W. M.

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CONTENTS.

CHAPTER I.

	PAGE
Hysteria: Psychic Anæsthesia for Touch; Psychic Anosmia; Psychic Blindness	13

CHAPTER II.

Recurrent Melancholia: Seasonal Melancholia; Melancholia arising out of Menstruation; Inter-menstrual Melan- cholia; Melancholia arising out of Dreams or Originating in the Post-dormitium; Melancholia during Digestion .	25
--	----

CHAPTER III.

Irregularly Recurrent Melancholia with Short Intervals and not in Apparent Relation to Function	53
--	----

CHAPTER IV.

Some Disorders of Sleep	58
-----------------------------------	----

CHAPTER V.

Choreoid Movements in an Adult Male, probably of Hysteri- cal Origin; Unusual Hysterical Movements in a Child; Hysterical Myoclonus	94
---	----

CHAPTER VI.

Subjective False Sensations of Cold	107
---	-----

CHAPTER VII.

PAGE

Motor Ataxia in a Child of Three Years, with Retained Muscle-reflexes; Pernicious Anæmia, with Locomotor Ataxia and Hysteria	125
--	-----

CHAPTER VIII.

Post-hemiplegic Pain; Præ-hemiplegic pain; Post-hemiplegic Disease of Joints; Post-hemiplegic Nodes	145
--	-----

CHAPTER IX.

The Treatment of Sciatica	154
-------------------------------------	-----

CHAPTER X.

Erythromelalgia: Red Neuralgia of the Extremities; Vaso- motor Paralysis of the Extremities; Terminal Neuritis	177
---	-----

CHAPTER XI.

Notes on Surface-temperatures as Affected by Posture of Limbs	205
---	-----

CHAPTER XII.

Three Cases of Remarkable Spinal Anterior Curvature with Mental Aberration	210
---	-----

CHAPTER XIII.

Concerning the History of the Discovery of Reflex Ocular Neuroses, and the Extent to which these Reflexes Obtain	220
---	-----

CHAPTER XIV.

Wrong Reference of Sensations of Pain	231
---	-----

CHAPTER XV.

Pseudocyesis ; Spurious Pregnancy	PAGE 236
---	-------------

CHAPTER XVI.

Hysterical Contractures	242
-----------------------------------	-----

CHAPTER XVII.

Hysterical Contractures (<i>Continued</i>)	275
--	-----

CHAPTER XVIII.

Rotatory Movements in the Feeble-minded	290
---	-----

 ERRATUM.

Page 53, in chapter heading, *for* "melancholia with long intervals," *read* "melancholia with short intervals."



CLINICAL LESSONS

ON

NERVOUS DISEASES.

CHAPTER I.

HYSTERIA: PSYCHIC ANÆSTHESIA FOR TOUCH;
PSYCHIC ANOSMIA; PSYCHIC BLINDNESS.

IN beginning this record of the lessons given at my clinic I may mention that this service is here carried on by the visiting physicians with the aid of the junior staff. Notwithstanding the small size of the hospital, the ward and out-services have given the material for such activity of clinical study as few larger hospitals can show.

The work thus done includes Morris Lewis's well-known examination with me of the Seasonal Relations of Chorea; a like essay on the Summer Prevalence of the Palsies of Childhood, by Sinkler; Osler's work on the Spastic Palsies; Eshner's excellent essay on Tremors; J. K. Mitchell's volume on Remote Consequences of Nerve Lesions; Hinsdale on Station in Health and Disease, and many papers, by the author and others, too numerous for more than allusive men-

tion. Still more valuable is it that here have been proved the availability of the so-called rest-treatment in open wards, and the possibility of thus giving to the poor what is commonly believed to be attainable only by the richer classes.

I feel glad to say, indeed, that while the papers named, and a host of others, illustrate the careful scientific use made of our wards and laboratory, we do not forget that the first object of our wards is the cure of disease.¹

Certain of these lessons, therefore, will not deal alone with the many singular cases which are likely to come before us, but also with therapeutic methods in use here before they were thought possible in hospitals, or that, as I think, are better applied and better known within these walls than outside of them.

The first case I ask you to look at to-day is from Scott Ward. Watch her as she enters. Her self-conscious, fixed facies will, or should, strike you. Note her ways. At one moment she seems blind; at the next, she moves with swift ease. Her case is full of these oppositions. I read it, and all of it, now, before her, as she is exceedingly intelligent, and will set us right if we err. Dr. Pershing, of Denver, has greatly helped us as to the early history, and saw with clearness of medical judgment into the true nature of this unusually instructive case, which, owing to its changeful features, has greatly puzzled me. I have now reached conclusions which carry my comprehension of it up to a point beyond which the case itself does not sufficiently yield clinical material for a further advance.

¹ In the report for 1895 is a list of papers produced by the staff and assistants.

CASE I.—B. L., a woman, aged forty-two years, married, applied for treatment October, 1892, complaining of blindness.

Family history. Her mother's father was paralyzed. One of her mother's brothers had hydrocephalus, and was epileptic and blind for a year and a half before his death from typhoid fever when twenty-seven years old. Her father died of pulmonary tuberculosis. One sister died of some spinal disease, said to have been caused by a fall three and a half years previously.

Personal history. The patient has two living healthy children; two others died. She has had five abortions. She does not use alcohol. There is no evidence of syphilis. Nor has she had any serious illness except typhoid fever at the age of fourteen years. For many years the woman has been greatly troubled by family matters, and especially in consequence of a child's death.

The present disorder began in 1887. Soon after a miscarriage she found that it was becoming difficult for her to recognize large objects, while small ones could be seen easily. In reading she was compelled at last to spell each word, because she could see only one letter at a time. She was fitted with glasses, but no relief followed their use. As time passed, vision grew worse. As the form-fields narrowed she recognized persons, not by their faces, but by their clothing and general bearing. She could see a small piece of silk or a pin upon the floor, but could not recognize large objects.

During the second year she lost, to a great degree, the power of recognizing colors. She could walk perfectly well, and avoided obstacles. During the third year she could still see small objects, but could not tell whether or not a house was completely built, or distinguish a man from a horse. In the fourth year she began to strike against objects in walking, and everything appeared dark. She

could distinguish between night and day, and even between a bright and a dim light.

In December, 1891, she was examined and treated by Dr. Pershing, who has kindly furnished me the following additional notes: "She is sent to me as being perfectly blind. Lately she has lost command of words and finds it difficult to carry on a conversation, because words do not come to her mind, and are not understood when heard, though she can readily repeat them after another person. Recently something was said about a dust-pan and brush. She repeated the words, but had no idea what they meant until she handled the objects, when the idea came back. She complains of inability to perform the simplest arithmetical operations (but this is inconstant), and also to recognize by touch familiar objects of dress, such as a belt. She consulted Dr. Starr and Dr. Roosa, of New York, in November, 1890. She could not name colors for Dr. Roosa, but a few days later sorted worsteds correctly for Dr. Charles H. Thomas, of Philadelphia.

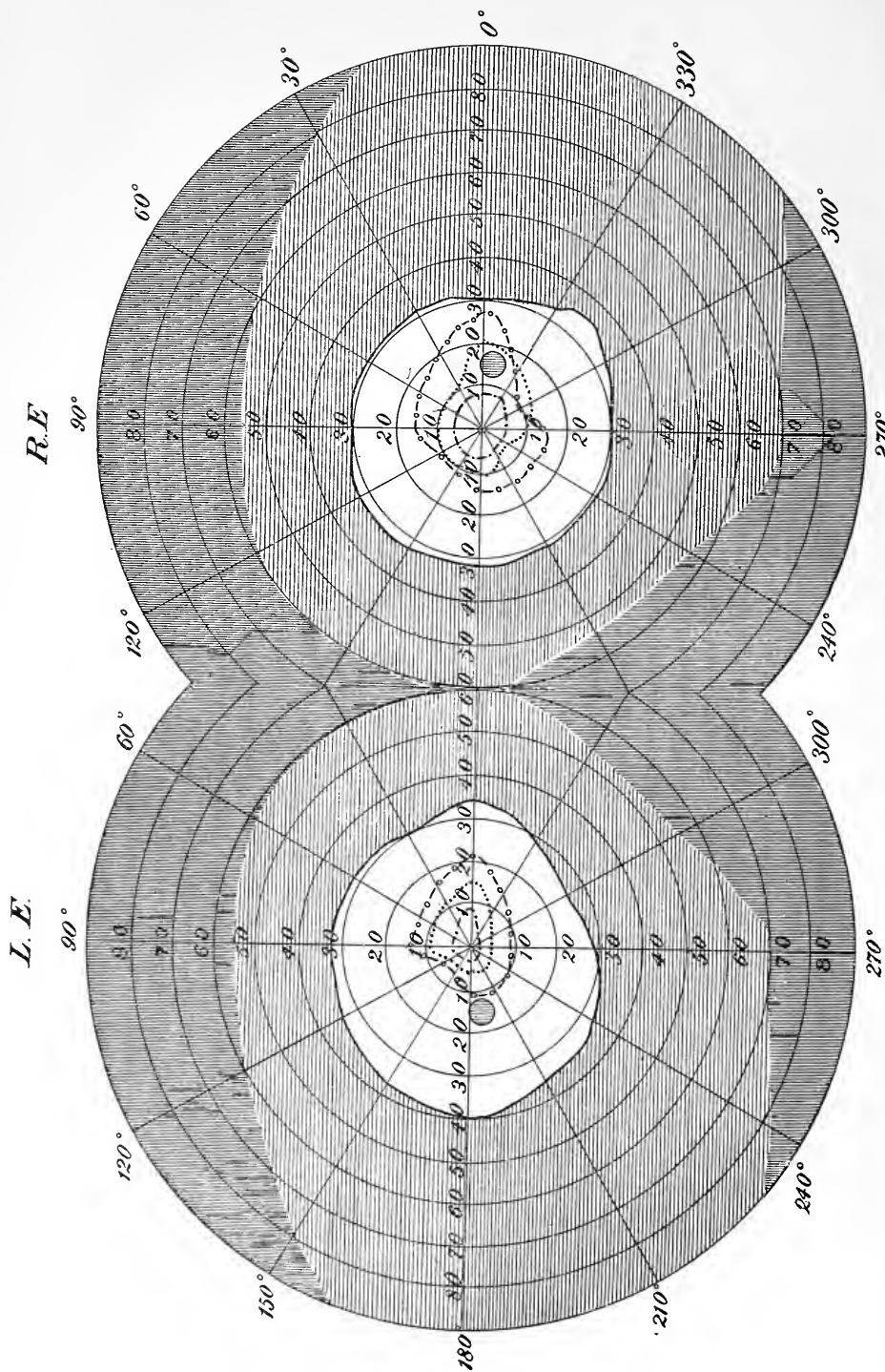
"*Status præsens.* She recognizes the difference between light and darkness. She cannot count fingers or the windows in the room. The pupils are equal and each reacts to light falling only on the other eye. The ophthalmoscopic appearances are normal. An interrupted galvanic current of one milliamperè applied to either side of either eyeball gives a distinct subjective flash. The examination of the other special senses, in all their forms, general sensibility, motion, and the reflexes, shows nothing abnormal. She is not led, and in going out of a room finds the door-knob without feeling for it, though not always. She improved under treatment by massage, electricity, iron, quinine, and strychnine, and moral means. Just before leaving the hospital she told me that she had thought she was totally blind, but she knew now that she could not

possibly have been so, because she was in the habit of doing many things for which sight was absolutely necessary. This statement was volunteered as the result of her own reflection. After careful study of the case I was certain it was hysterical." (The accompanying diagrams show the fields of vision taken by Dr. Pershing.)

The improvement in her condition that took place while in Dr. Pershing's care soon disappeared under the stress of family trouble.

Present state (October, 1892). The face, when at rest, is vacant and expressionless. The woman moves about the room with apparent ease, and rarely stumbles against an object. While her gait is not that of a blind person, it also is not that of one with normal vision. When any object is put before her eyes she says she cannot tell what it is. On being told to cross the room and speak to a gentleman standing there, she goes in the proper direction, but is greatly surprised to find, on hearing the supposed man speak, that it is a woman. When a watch is given her and she is asked to tell what it is by touch, she fails. If, however, it is put near enough to her ear for her to hear the ticking, she names it immediately. She fails to recognize a clothes-brush by touch, but when she hears me use it, says: "It is what you brush clothes with—a clothes-brush." The same is true of a nail-brush, except that she calls it a hair-brush. She cannot at first recognize a key by touch, but, on being told that it has to do with a door, says, rather doubtfully, "It is a door—door-knob," and then quickly corrects herself, saying, "No, it is a door-key." She fails entirely to recognize a knife by touch. On being given a pencil she calls it a penknife, and adds, "It is what you write with," and does not seem to be aware of her error. At one examination she was entirely unable to tell coins or even to recognize that they were metal, but the next day she recognized a five-cent piece

FIG. 1.



Diagrams illustrating the contraction of fields of vision. The continuous line indicates the extent of the form-field in this patient, the broken lines that of the color-fields—blue, red, and green—in the order named. The test-papers were 2 cm. square.

after considerable difficulty, and then quickly told quarters, halves, and dollars. She could not, however, distinguish between a one-cent and a five-cent piece. A penholder, with pen attached, she calls a pen. A plate she names properly, but calls a tumbler first a plate, then a bowl, and finally a tumbler. A pin, a needle, a book, a pair of scissors, and a piece of paper she knows instantly by touch, but sometimes not at all. She says that a ball put in her hand is round, when asked its shape, and recognizes a piece of cardboard cut in the form of a circle. She calls a triangular card three-cornered, but all rectangular cards are to her square. An oval she sometimes calls square, sometimes round. After being told several times what an object put in her hands is, she remembers it and answers correctly several days later.

The sense of contact is perfect. There is no anæsthesia. She immediately responds when touched, and can tell the point of a pin from the head, always answering properly "dull" or "sharp." She cannot, however, localize sensation, so as to name the fingers, but can put a finger correctly on the place touched. The pain-sense is normal. The temperature-sense is normal.

If salt or sugar be put upon the tongue, she names the former and says the latter is sweet like candy or sugar, and taste seems to be correct as to even more delicate flavors. Given benzine, cologne, alcohol, and oil of turpentine to smell she says she recognizes them as different, but cannot name them. She says they are unlike. She can write her initials and the first part of her surname fairly well, the latter part being a scrawl. She cannot, however, write any isolated letters except o and c. She describes the latter as o with a piece cut out. If her hand be guided in making letters, she still fails to recognize them. She cannot even write the letters of her name unless she begins at the beginning.

What may be called spontaneous speech—I mean the speech of ordinary conversation—is at the present time normal, though she claims that formerly she misused words. For example, though she may not be able to name an object when given to her, yet if she wants it she will use the proper word in asking for it. Notwithstanding her claim that she has forgotten how to spell, she spells short words correctly. She also solves simple arithmetical problems. She is nervous, depressed, and at times lachrymose.

Dr. de Schweinitz has examined her eyes and reports as follows: “There is divergent squint in the right eye. The pupils are large, reacting slowly to light; the right very sluggishly. The discs are grayish-red. The veins are full; the arteries are small—the smaller in the right eye. There is lack of fixation, but the patient sees light in all directions. The right eye open (the left closed) perceives objects to the left of the median line and sometimes in the middle, but not to the right. The left eye open (the right closed) perceives objects to the left and in the median line, but not to the right. There is partial right lateral hemianopsia. Given cards to sort, she matches blue ones correctly, but confuses red and green and all others. It was impossible to take the color-fields.”

REMARKS. A few preparatory words may make easier for you my after-explanations. We associate with known objects their possession of certain qualities of dimension, form, texture, color, etc. These objects are mentally classified and labelled—a pencil, a box, a hat, and so on. When we see or handle one of these objects, and find by sight or touch that it possesses a group of qualities, we must determine on the label, after swift comparison with the collected complex memories of things already seen or handled, or both.

It will help us to look at this problem in the most simple form. When we examine by sight or touch a familiar object, a single hint, as it were, may suffice, as the tick which suggests a watch. If the object be very novel, the examination as to the determinative properties and their associations and degrees may be long and difficult. We store away these acquisitions for comparison in certain cerebral centres, visual or tactile, or both.

As regards olfaction, the questions the examinative sense, so to speak, can ask and answer are limited. Usually, as concerns the non-pungent odors, one single quality is perceived, and from it the individual reasons by comparison with past memories of scents, and declares the label he is accustomed to assign to the odor in question. This is very simple, compared to the complexity of the properties by which visual and tactile recognitions are made.

In persons who are "*mind-blind*," as Munk called it, "the thing put before them is seen, but suggests no corresponding psychical idea." Now what is here meant by being seen is one of two things, or both together. The thing seen may be present to the man as an image is to a mirror, for the mirror has no memory, and cannot compare the present with the past; or else it is meant that beside this the object so seen may present recognized qualities, but that the patient has no power to place these for comparison with those of other periods. In neither case can he label the object or say what use it has, although he may occasionally do this latter, even when he cannot name it. The object may be seen, its qualities compared with older memories, its nature or use be thus known, and yet the power to label it with the vocal sign we call a word be lost.

These sets of conditions are all seen in this case at times. Thus, I blindfold the woman, and offer to her nose vinegar, cologne, asafoetida, valerian. She says they are different; does not take one for another. In other words, she does not say all alike are odors without difference; but a clear perception of the single quality so felt as different in each cannot be lodged in relation to former knowledge for comparison. Hence it has no distinctiveness and cannot be labelled.

It is interesting to study this simple case, and then that of sight. Here the partial general blindness and the added hemianoptic imperfection complicate matters, and these conditions vary from day to day. You will remember, also, that all color-sense is dead, except as to blue, and that the form-field is much contracted. Still, at times she can see the hands of a watch—not, however, so as to tell the hour. At her best moments she may appreciate qualities sufficiently to say that one thing is larger than another, but not so as to say that this is round or square. At these times she is able to distinguish one person from another, but never to label them until they speak. In her worse ocular states she cannot distinguish any form of qualitative difference. You will remember that Dr. Pershing describes her as having been at one time word-deaf, as now she is word-blind.

This trouble is better known and more often seen than the yet more curious form of defect as regards touch. Remember that she can tell heat, cold, touch, pain in all degrees. Occasionally she spontaneously describes a test-object; more often she does not, and yet is able, as the stated inquiries show, to answer correctly all the queries competent to describe an object.

Very often the final question, What is it? she cannot answer; or else, and rarely, says what it is for, but not its name. At other times she cannot reply as to the qualities as told by touch alone, or tell scissors from a corkscrew, a book from a watch; and yet tact is perfect. This corresponds to mind-blindness. She is mind-touchless. There is psychic anæsthesia as to touch; or, to be more accurate, either this is true, or else she has lost the power of mentally comparing new sensations with the stored memories of those long acquired.

I have not spoken of the localities involved in this triple loss. Concerning these our knowledge is still incomplete, and cases of hysterical representation of these singular symptoms are least of all suitable to help us. And certainly this patient is an hysterical illustration of mental incapacities to use the information won through smell, sight, and touch; and, as I am sure such cases are very rare, I have thought it worth while to state for you the reflections which this one has brought to my mind. Dr. Pershing had reached a like conclusion early in the case. Of course, these cases all have alexia and agraphia. It has been suggested that the various memorial incapacities, such as the total loss of knowledge of localities or of individuals, may be limited forms of mind-blindness, as if one room in the many mansions of memory were suddenly walled up. These are, I think, yet more complex conditions of psychic disorder, and only a part of them may fairly be referred to the form of mental trouble which this case exhibits in so many varieties. Finally, we need a better term than *mind-blind*, and a good word for the corresponding condition in which touch and smell are involved.

It has seemed to me that all of these curious states of consciousness as to objects seen or felt may be represented in the changing psychic development of a child—objects seen in early life are first represented as on a mirror; later, their qualities are defined; and, lastly, they are labelled.

Dr. Pershing writes to me of the later history as follows :

March 9, 1896. The woman with mind-blindness gradually grew worse after her return from Philadelphia. While walking one evening with her mother, who is very deaf, they were both struck by a cable car, but apparently not seriously injured. When I saw Mrs. S. a few weeks after this accident she could not talk rationally on any subject, but kept talking in a senseless, bewildered way, the words being distinctly uttered with occasionally a pause, as though the word did not appear in memory. “ Water-closet ” was repeated with especial frequency, without any logical or grammatical connection with other words. The intellect was evidently much impaired, and she had to be constantly attended. The pupils were widely dilated, and one eye, the left, I think, turned out. The pupils did not contract in a bright light. The ophthalmoscope showed nothing abnormal.

In the summer of 1894 she came as an insane patient to the County Hospital, in my service ; but I was away at the time, and Dr. Eskridge, who had charge of my patients, had her taken to St. Luke’s as a private patient. That ended my connection with the case, but I know that she remained demented and was at times noisy. She died in the autumn of 1894.

CHAPTER II.

RECURRENT MELANCHOLIA: SEASONAL MELANCHOLIA; MELANCHOLIA ARISING OUT OF MENSTRUATION; INTER-MENSTRUAL MELANCHOLIA; MELANCHOLIA ARISING OUT OF DREAMS OR ORIGINATING IN THE POST-DORMITIUM; MELANCHOLIA DURING DIGESTION.

I HAVE long had in mind to speak to you of certain forms of the mental disorder we call melancholia, and of which at this clinic we see so many examples. It sometimes offers for our consideration peculiarities of origin which have not received the attention they should have had.

As usual in these lessons, which are informal, and not meant to cover the whole medical history of the subject, I shall limit myself to speak of so much of the matter in hand as shall appear to me desirable to dwell upon. Assuredly, the treatment of mental disorders is one of the least satisfactory of the varied problems with which we have to deal. About nothing do we know less than of the true pathology and ultimate cause of the disorders which we group under the name of insanity. Indeed, we are as yet uncertain as to where within the skull is the nerve-matter with which we think or imagine. The abruptly occurring accidents to, or diseases of, joint, muscle, or nerve, we can measurably comprehend; but when we come to deal with disorders of the brain we are at once face to face with certain unanswered questions.

While most disorders of the mind are apt to originate gradually, and often take a long while to become formidable, at other times these troubles spring up suddenly; and this is more frequently the case with all the forms of methodically recurrent disease of the mind. I do not mean to say that sudden outbursts of mania or melancholia, such as, according to the German writers and others, are more prone to occur in recurrent examples of these disorders, are very common; but only that they are to be met with, and that when we do see them they still further emphasize the difficulty of explaining that which happens within the brain at the time of occurrence of such outbreaks. A strong emotion, a dream as I shall show, or some as inexplicable cause, may occasion forms of temporary or lasting mental disorder, for which we have as yet no reasonable explanation. The largeness of the psychical and the smallness of the observable co-attendant pathological physical conditions never cease to amaze the thoughtful.

Usually these and all forms of such morbid psychoses get well slowly; but sometimes recovery even in chronic cases is as abrupt as may have been the origin, and then one asks in vain what could have been the nature of the morbid factors which, acting suddenly or slowly, are efficient for years, and perhaps cease to have disordering competency in a night or a day. Such cases are, indeed, rare, as I have said; but they do exist, and may be met with at times in some of the recurrent melancholias to which presently I desire more especially to call attention.

The individuals who constitute mankind have what one might call a par of cheerfulness. It varies, of course; is subject to the vicissitudes called moods, and is low

or high according to the nature of that lifelong mood which we describe as temperament. This climate of the mind may be such in certain persons as to defy all forms of misfortune, and to preserve some sense of happiness in the face of poverty, disease, disaster, and even death itself. There are others who so precisely reverse this happy constitution of mind as to need from me no further description. It is quite sure that either mental attitude can be combated or fostered. The wisdom which cultivates cheerfulness until it becomes habitual is of the mental hygiene of habit.

The atmosphere of cheerfulness is often a family gift, an inheritance; you feel its presence with some people, in some houses. Other men or women carry with them a certain indefinable air of defeat, discouragement, and gloom. Such persons and such families are not, of necessity, liable to that morbid condition we call melancholia; for, as Clouston has very well insisted, mere melancholy and melancholia are two quite different things. The disorder may alight on the most cheerful. There are, however, persons, and rarely whole families, who, living continually below the normal level of that happiness which comes of natural cheerfulness, are of those who are foredoomed to have, at irregular intervals, attacks of melancholia, and to be always nearer to suicidal temptations than the rest of mankind. Such races should not be perpetuated; but society has not seen fit to protect its future, and I have only once known an instance of such a family having resolved, by avoiding marriage, to end what had been ancestral generations of disaster.

I was permitted years ago to print the record of one of these unhappy races, now, I believe, extinct. I

never used the privilege, and have within a few years mislaid the memoranda furnished me by one of its number. I retain a distinct remembrance of enough of this history to serve my present purpose. The people concerned were none of them remarkable for mental gifts above the average of man. I knew four of them; three of these were sallow and had dark skins and black hair; they described their parents, who were cousins, as having been of like appearance. All of them who were known to me were physically sluggish, and more or less lacking in every-day gaiety; but two at least were humorous at times, and apparently capable of amusing others more than themselves.

In about one hundred and fifty years, in the various lines of descent known to them, they had record of eleven suicides, nine having been males and two females; there were several epileptics, much drunkenness of later years, and in every generation cases of insanity—sometimes acute mania, more usually melancholia.¹ When, quite thirty years ago, the family became reduced to three single women and one man, an agreement not to marry was reached, and was, I believe, scrupulously kept. I saw two cases among these people. Both were in women between thirty and forty years of age; both were pure melancholias without delusions, except as to religious matters; both were piteous examples of the mental suffering which this disorder may inflict.

I have occasionally known, in a long experience, persons who all through life were subject to what are popularly called the “blues,” to moods of depression and

¹ With all of this sad history it is notable that there was no instance of any form of crime.

the like, but who throughout escaped true melancholia. There are, as I have also said, exceptions to this happy rule, and the family whose history I allude to were for the most part sad-minded people. The only one of them who entirely escaped attacks of insanity was a quite cheerful woman, who had the fair hair and blue eyes of a grandmother of another race.

It is a question how far the individual of breeds like this one may be influentially hurt by knowledge of such a series of mental disasters among near relatives. I am sure that most persons so situated would be apt to feel a dread of the coming of their family peril; but if this natural apprehension be capable, in turn, of adding a serious contributive factor to hereditary tendencies, I do not fully know.

I have been many times consulted as to the propriety of marriage in cases of those who have been insane, or who are come of those rare families in which neuroses have been so frequent as to make reasonable a doubt as to the right to doom offspring to the probabilities of mental disorders. There are extreme cases in which decisions are easy. It is the other groups which are hard to deal with; I mean those in which the record is not so terribly disastrous as in that which I have selected as a typical instance. All sorts of questions are involved: emotional, social, economic. The quality of the previous insanities is to be considered, and the nature of the causes which seem to influence the outbreaks. If it be a varied family history with which we have to deal, the matter becomes difficult, and often anyone, except a modern psychological novelist, would, and perhaps sometimes should, with reason, refuse to give positive advice.

I should like, did my time permit, to study with you here this interesting problem. I should like to see it fully discussed by some alienist of large experience, capable of dealing with it from all points of view.

Closely connected with this matter is the advice to be given as to the training, and the moral and physical education of the children of persons in whose families there is or has been such frequency of mental disorder as to make it wise to consider these risks while we are still able to handle the plastic material of childhood. Here again is a problem, not unanswerable, and needing to be largely considered.

I pass from these hints for the reflective, to ask attention to some of the melancholias which, as to origin, seem to be conditionally related to season, function, and other more obscure factors. In treating of this subject I shall for the most part limit myself to cases of which I have had personal knowledge, or which, having been obtained from my friends, have not been hitherto put in print.

Recurrent melancholia is, of course, at times only a part of the cycle of a form of circular insanity. I have endeavored to exclude all such examples. There is, however, I am sure, a form of very mild circular insanity to which sufficient attention has not been given. In this we have melancholias of ordinary or extraordinary type, followed by periods of greater or less duration, during which the person is neither maniacal nor subject to delusions, as in the more typical circular insanities. In these, to which I now call attention, the interval between two attacks of melancholia is merely remarkable for the excessive gaiety of the patient. It is often sufficient to attract attention as

unusual and beyond what had been observable in the same individual during a period of perfectly normal life.

The recurrent melancholias I have seen and desire to discuss were productively conditioned on season, time of day, function, such as menstruation or inter-menstrual periods. Then, again, there is melancholia distinctly related to the meal-time, or, rather, to the digestive period. Finally, there is the melancholia which is the strange temporary outcome of dreams, or is related to the post-dormitium. I have elsewhere written of the psychoses, and especially of the melancholias and manias, due to drugs, such as bromides, trional, cocaine, or hemp.¹

It is familiar knowledge that melancholia is apt to recur in the person of one who has been once attacked. These returns may be after a year or less, or after many years. Too often where the interval is brief the patient has never been quite restored to the full normal of cheerfulness. The recovery, too easily assumed, is only a lessened state of depression, and soon again, the curve of melancholia rising, the patient is said to have a second attack. This truth as to many of the melancholias which return at irregular and short intervals has been clearly recognized by many of our own alienists. It is not of this type of irregular recurrence that I desire now to speak.

The melancholias which recur frequently may do so at certain times of the year, and may continue so to return year after year. These cases I may be allowed to call *recurrent seasonal melancholias*. Some deter-

¹ Proceedings of the Association of Physicians and Pathologists, 1896.

mining connection with the season or its phenomena seems to be efficient in evolving an annual attack. The time of onset may vary within a month or two. Usually it is in the spring or early summer, and so much more common is this than attacks in winter, that it has made me eager to know how far season is influential in setting the date of such outbreaks as are primary or recur at longer intervals.

Regularly recurrent melancholias may be of any of the several species which are included in what I may call the genus melancholia. The termination may be finally as various as in the ordinary single or irregularly recurrent examples.

Well-marked seasonal melancholia is a rare disorder. The case which I shall first relate is an admirable illustration of the malady. I owe it to the kindness of the attending physician, Dr. M. V. Ball, and its completeness to the very full notes made by my assistant, Dr. Rhein:

CASE II.—The patient, D. B., is a Russian by birth, aged thirty years, married, and has borne two children. Her business is that of a midwife. The beginning of her disease dates sixteen years ago. It consists in a periodical recurrence of a profound state of melancholia. In her family history there is strong evidence of predisposition to insanity. Her mother suffered from melancholia during a part of her life, a sister killed herself while mentally depressed, a second sister is extremely nervous and hysterical, and two maternal cousins are afflicted with melancholia.

The patient's health prior to the onset of the present affliction was extraordinarily good. She possessed an unusually acute mind, and had a most retentive memory, easily acquiring at an early age command of three languages besides her own.

The first symptoms of her malady appeared shortly after her first menstrual period, at fourteen years. There was only a mild mental depression at this time, which lasted four weeks, and from which she recovered entirely. In a year's time she experienced a return of the same condition, which lasted again four weeks. A third attack was induced by a serious cause of worry eighteen months later. About this time her memory began to be rather less perfect, and she observed some defect in her mental powers. Her first pregnancy was the occasion of a fourth slight return of mental depression, quite mild in character and lacking entirely delusional or suicidal tendencies.

The first of the regular series was induced by the death of her child. The attack began in March and lasted until September. Her symptoms were then precisely those which I shall presently describe. Since that time, sixteen years ago, with persistent regularity as the month of March approaches, she falls into a state of melancholia from which hitherto there has been no escape. The symptoms of the several attacks vary but slightly; her accustomed attitude is then highly characteristic. With hands clasped before her, her eyes fixed in an upward direction, she remains seated for hours, refusing to converse, declining to eat, and frequently weeping. The recital of her mental condition during an attack, while most pathetic, is of unusual interest. There are constantly floating through her mind, she says, the most depressing thoughts. Her condition renders her a burden to those about her; she is unable to support herself; her capacity for work is gone; she is unable to think correctly, to act properly, so that she considers that, altogether, it would be infinitely more pleasant to end all her troubles by suicide. This idea is continually uppermost. She craves death and is constantly discussing with herself plans to effect it. For the sake of those about her she is dissuaded from killing herself while in the house;

but to go out of doors is quite impossible; no will-power exists to prompt such a move. She thinks, if once out of doors, there would be no barrier to the consummation of her desire. This lack of will induces within her an intense hatred of herself, as she says, "like as no one has ever hated before." The mental anguish is so great that bodily pain is not felt if it chances to occur. She has frequently attempted suicide by exposing herself to cold night-air with perhaps only a single garment. Thus death, she thinks, could be achieved without inflicting on her relatives the ignominy of suicide. She has unsuccessfully attempted suicide several times by swallowing poison. In several instances the attack has been precipitated by mental shocks, but more frequently there has been no such exciting cause. Emotion or disaster at other seasons will not bring it on. During the intervals she is happy, industrious, and capable; said to be in a really normal state. For a short time in a day, now and then, there may be some trivial depression, which she has not the slightest difficulty in shaking off. When the month of March arrives she is entirely powerless to rise above these depressed feelings. She becomes most apprehensive of a return, the anticipation of which seems to lower her resistance.

There have been always intense headaches at these and of late at other times, which no medicine has permanently helped. Krafft-Ebing partially relieved her pain for six months by hypnotizing her every three days. He was never successful in inducing a very profound state of hypnotism. At my request, Dr. Rhein brought about this condition and made her quite completely insensible, producing the highest degree of hypnotism, during which suggestions as to relief of headache were made with considerable success.

An examination of her physical condition in health is

as follows: Her station is good; the knee-jerks are slightly increased; there is no clonus. The strength of the muscles in general is normal. There is no change in sensation anywhere. The tongue is coated, the digestion is fairly good; bowels irregular during the attacks, but regular at other times. The heart and lungs and uterine functions are normal. The urine shows, but only at times, free uric acid, and is in other respects natural. There exists a slight error of refraction in the eyes, but no change in the fundus and none in the form- or color-fields.

The attack, as I have said, comes on in March, and usually she may expect it about March 1st. It lasts until August, and goes away somewhat slowly, becoming now better, now worse, until it disappears. The early attacks came on abruptly, in a single day, and left in the same manner. When they are coming on she has anorexia, loss of vigor, and her sense of duty and her will-power are soon in abeyance. No efforts seem to have been made, by any radical treatment, to anticipate the coming on of her trouble. I hope, during the ensuing spring, to make some effort to relieve her. My belief that there was an hysterical basis for her melancholia has been confirmed by an interesting incident:

On January 20, 1897, this patient was insulted in the street at night and pursued by a drunken man. The next day, on awakening, she had complete loss of power in the legs and insensibility in all forms below the knee. Dr. Rhein hypnotized her and she was at once able to stand and move freely when ordered. Two days later, at my clinic, she was again hypnotized and walked still better. This treatment will be continued, and under it no doubt the paretic state will disappear. As she will now remain in the wards, I hope by this and other means to ward off the annual attack of melancholia. The ease with which the hysterical paraplegia came on points to the possibility

of the recurring mental disease having been hysterical. It does certainly offer also in its history some suggestive facts corroborative of this belief.

In the large experience of my service, Drs. J. K. Mitchell and Dr. de Schweinitz have found, as I have before stated, very few cases of such changes of the color- and form-fields as seem to be common in France in hysterical palsies. Fortunately, Mrs. B.'s eye-grounds were studied with care some time ago and found normal. Just now the color-fields are reversed, and this is the first time I have met with this symptom in hysterical paraplegia.

CASE III.—I saw lately a woman, aged thirty-nine years, of a family in which the mother had had melancholia. This lady, in November, 1888, after some trivial worries, became melancholic. The attack lasted a month. In May, 1892, after childbirth, the attack recurred and lasted until the next February. Since then she has had mild melancholia beginning every August and getting well toward the close of January. In the intervals she is described as happy and sometimes as too hilarious; but this she denies, and declares that she is in a perfectly natural condition. The melancholia in this case is of the simplest type, and without delusions.

CASE IV.—Another example of melancholia, confined to the months of April, May, and June, was, for the certainty of its return, unusually interesting. R. W., aged forty years, naval officer, unmarried, of good habits, came of a family well known to me as healthy and of unusual ability. At the age of thirty-four years he was perilously ill in the spring with coast fever, while on the shores of Africa. He recovered very slowly, but was never again as vigorous as before. The next spring, early in April, he had a sudden and seemingly causeless melancholia, with suicidal impulses, but without confessed delusions. All the previous winter he had been weak and dyspeptic, with an

irritable bladder and immense deposits of oxalates, but rarely any free uric acid. The melancholia lasted until July, and this attack repeated itself, with systematic persistency, every year, seven successive times. Meantime he acquired improved health, lost his oxalates and bladder-trouble, and was able to eat without indigestion if he were reasonably careful; nor did the condition of the urine to which I have alluded return again during the successive attacks of melancholia. His urine was at these times singularly free from the deposits so commonly seen in these cases, and in fact in many forms of insanity. Still, whether at home or at sea, in city or country, his attacks returned every year. After eight of these onsets he married, and thenceforward was not again the victim of melancholia up to his death, from pneumonia, at the age of fifty-one years.

Here, again, there was some determining element in the spring, but beyond this evident conclusion I am unable to go.

I owe the two cases which follow to the kindness of Dr. Allen Starr:

CASE V.—Mrs. L. N., Kansas, born in 1857. Father was healthy. Mother was a nervous invalid, and she has been nervous from the time she was sixteen. She has two sisters who are neurotic and one brother who is peculiar but has never been insane. One aunt on the mother's side is said to be erratic. The patient's first attack of depression occurred in 1885, beginning in February, and was associated with the sudden cessation of menstruation. She became discontented, restless, moody, and depressed in spirits; was wilful and irritable, so that it was impossible for her to do housekeeping or manage her family. Her condition during the first attack was diagnosticated by Dr. Barstow, of Sanford Hall, Flushing, as melancholia. The attack lasted until July 1st, when it passed off sud-

denly with a recurrence of menstruation. She had similar attacks every spring, the exact dates of which are not known, until 1891. In 1891 her attack began on March 17th and lasted until September, the condition of depression being attended with suicidal tendencies, so that she had to be carefully watched during the summer of 1891. I first saw her in November, 1891, and had the charge of her until the following March, during which time she suffered from anæmia and asthma, but was normal mentally. On March 30th, after an attack of tonsillitis, her entire manner and character suddenly changed. She became excited, unduly talkative, restless and irritable, very unlike herself in appearance, manner, and actions; and this period of excitement and restlessness lasted for ten days and then suddenly changed into a condition of deep melancholia, in which she dreaded seeing anyone, was despondent, cried, was slow in her mental action, could not concentrate her attention or undertake any work for the management of her house; disliked to see her children, was afraid she would do them harm, evidently had suicidal tendencies though she attempted to conceal them; slept badly, lost weight rapidly, became anæmic, constipated, and suspicious. She remained in this condition until August 10th, when with the recurrence of her menstruation, which had ceased from March 30th, she became apparently suddenly well.

She had a similar attack during the spring or summer of 1893, 1894, 1895, and 1896, each attack beginning with a period of excitement lasting two weeks, followed by a period of depression lasting several months. The attack in 1894 began in April and lasted until September. It was not benefited by a trip to Europe. The attack in 1895 began in May and lasted until September 22d. The attack in 1895 lasted from April until August. I may add that this lady had frequently an excess of uric acid both in and out of her attacks. There were in this case eleven consecutive attacks of melancholia.

CASE VI.—T. K., male, born in Massachusetts in 1868. Family history bad. Cases of insanity on both father's and mother's side. One aunt at present in an asylum with paranoia. He was born two weeks before time and weighed only five pounds, but appeared to be well until his fifteenth year, when, in the spring, it was noticed he was acting in an unnatural manner. He wished to be alone; he could not fix his attention upon study; he became morbid in various ways and much depressed. Such attacks have recurred every year since that time; that is, from the year 1883. In 1888 he began to study medicine, and in March, 1889, first came under my observation with the previous history. Examination showed a large, muscular man, six feet high, and well developed physically, with a very small head and a degenerate type of asymmetrical face, badly formed ears, and high palate. Physical examination of internal organs negative; heart rapid, 95, but no murmurs. Good digestion; no anæmia; urine normal. Mental condition of depression. It is difficult to get him to talk; he remains quiet for hours; refuses to see anyone; prefers to stay at home, and will not see friends or occupy himself, excepting occasionally with outdoor work in the garden. He constantly reproaches himself with various imaginary evils, and everything that he has done seems to him to be just the wrong thing, and he says if he had not done this or that he would be all right. This condition persisted from March until July, when it gradually passed off, and he was well during the summer. A recurrence took place in October, 1890, when I saw him again in the same depressed condition, confused in his mind, unable to read or study, moody and dull. His reaction-times to sight and hearing were carefully tested, and found to be increased in duration. This condition lasted until December 23d, when it passed off suddenly. In September, 1891, he had a recurrence of the depres-

sion, which lasted until December 29th. During this time he was melancholy, unable to concentrate his mind on any work, talked slowly, but had no active delusions. He spent this period in the Adirondacks, and was out of doors most of the time. Recovered suddenly; as he expressed it, "came out from under the cloud." I did not see him again until December 26, 1894, when he was again in a state of depression, and said that he had had attacks lasting from September until December each year in the preceding three years. When I saw him he was in a state of deep melancholia. December 1, 1896, his father reported to me that he recovered from the attack in 1894 during the middle of January, but that he had an attack from September to December, 1895, and that now (December 1, 1896) he is in an attack which began in July.

This man has therefore had yearly attacks of melancholia from 1883 to 1896 without any exception, lasting variably from three to six months.

The urine was examined very many times and with care. It was not found that the urea, uric acid, whole quantity of fluid, or total of contents had any relation to the presence or absence of the mental disorder. There were in this case thirteen attacks—one each year—at first in the spring season, but later in the autumn or summer.

Here, too, as is not uncommon in this interesting type of melancholia, the suddenness of the ending of the disorder is worthy of remark.

CASE VII.—An autumnal example of recurrent melancholia was seen by me many years ago in a male, aged thirty-seven years, a planter, living in a highly malarious part of South Carolina. He came of a family exceptionally free from insanity and, too, from all other neuroses. At the age of twenty-four, in June, after a period of emotional distress, he became melancholic. In the autumn he made

a good recovery, and resumed his business. Two years later from October he had, without known cause, three months of apathetic melancholia. This repeated itself two successive autumns. Then he had no more until he was thirty-one, when he had again, in the month of September, an ague, and after it four months of simple melancholia. I saw him when he was aged thirty-eight, and he had then had three years in sequence autumnal melancholia, never outlasting the winter. I studied his case in the last attack. His urine was loaded with dumb-bell oxalates, and had at times urates or uric-acid crystals; but none of these deposits were persistent. His state of stomach caused me to advise a skim-milk diet. Under this, as usual, all uric acid and oxalates disappeared, but the melancholia was none the better. Anti-periodics, such as quinine and arsenic, had proved of no service, but he was sure that he escaped attacks if he went north in summer and remained until January. I know nothing of his later history.

I have met with other less striking examples of seasonal (usually spring-time) melancholia. I have seen others in which melancholia was one of the cyclic changes of circular insanity, but in which, or at least in two cases, the melancholia began always in the spring, and was replaced in summer by a state of wild excitability, the midwinter months being free from any distinct disorder of mind.

The simpler cases are to me of great interest. At my clinics the seasonal relations of certain neuroses have in the past been studied with care by Dr. Morris Lewis, Dr. Sinkler, and myself, and it is possible that some such study of the time of onset of non-recurrent melancholias may prove of interest and value. So far, my own cases have yielded to the most careful study no explanation of their recurrence at a certain, or near a

certain time of year. Undoubtedly they were not of merely lithæmic parentage, and the bare fact that in these, as in so many insane people, the urine is at times loaded with urates or free uric acid or oxalates seems to be of little or no causal moment. I think that Lange's authority has caused too much importance to be attributed to the connection between melancholias and the presence of free uric acid.

If we may trust the statements of Pinel and some others, there is in chronic insanities a tendency to exacerbations in summer. "It is curious," says Pinel, "to observe the effect of the solar influence on the return and march of the larger number of attacks of mania" (whether he means only the wildly insane or includes melancholias is not clear); "it is common to see them renew themselves with more or less violence during the months which follow the spring solstice, prolong themselves with more or less violence during the hot season, and end for the most part in the decline of autumn."¹ He adds that storms excite the insane of all kinds, a question which, with our knowledge of storms and our complete control of weather statistics and records, should become at once a matter of careful and considerate study in some of our great asylums.

In looking through the literature I find many reports of *irregularly* recurrent melancholias, as of several brief attacks in every year and the like, but as to seasonal melancholias I find little that is satisfactory. Henry M. Hurd reports two in the American Journal of Insanity. One of these began in July, 1883, and quickly got well. The second attack lasted a month from June, 1886.

¹ Is this the case with us?

Then they came on in successive years in May, April, March, and August, lasting two or three months in each case. These were onsets of melancholia agitata with delusions. The rest of the year is stated to have been a time of entire sanity.

Schule, *Klinische Psychiatrie*, 1886, has an interesting article on periodical melancholia, in which, while he speaks of the singular abruptness of onset and termination of some of these attacks, and of their being not rarely regular as to seasonal times of occurrence, he does not state the season in which they are most likely to obtain. He adds that periodical manias are for certain patients so regular in their recurrence that the sufferer can with correctness count on their coming in certain months. I do not know of any later and complete study of this subject, and, in fact, that which I have thus stated is incomplete and is lacking in such detail as is desirable. Here, again, is a subject to which some one in the great asylums should give present attention.

Pinel and Calmeil have as to these points certain statistics which seem to show that admissions are more frequent in spring and summer in France; but these would be more valuable if in place of admission dates we had dates of the outbreaks, and still more desirable if we had such statistics in regard to our own country, and as to climates which vary from ours and from that of France. I have been told that recurrent seasonal melancholias are not quite so unusual in Cuba as with us, and that they are apt to come on with the hot weather and to pass away with the cold. I have seen recently one such case from Cuba, in which the melancholia came in several successive years—I think as

many as six—in the month of May, and ended always about the first of January. The obvious indication in all these cases would be a change of climate,¹ but I do not know of any case in which this has been employed, except in the interesting autumnal example which I have already quoted. Nor, may I add, do I know of any other example of seasonal melancholia in the autumn, though it is quite possible that the experience of some of our Southern physicians might furnish me with instances, and perhaps even of such as can be shown to be distinctly related to the presence of malaria.

The effect of the normal menstrual function on the increase of melancholia already present is well known; but I do not find it stated anywhere that some persistent melancholias in women are extraordinarily better at this very time, and that the gloom deepens again during the interval between two menstruations. The two cases of which I have notes were young married women. Both were unusually simple examples, and both recovered after a year. It must be common knowledge among observant physicians that many women are depressed and gloomy during the menstrual period; but there are also cases in which a brief but typical melancholia, with or without delusions, and in some with suicidal tendencies, does develop at this time and last for a few days. As interesting are the menstrual melancholias with erotic tendencies, or those which are homicidal.

CASE VIII.—C. B., of California, a single woman, in easy circumstances, aged thirty-four years, in perfect health; had no family history of insanity that could be

¹ In one of Dr. Starr's cases this proved of no value.

traced. The father died of locomotor ataxia, with no history of syphilis. Of late years during menstruation she had had a quite profound and increasing melancholia. For a long time she succeeded in hiding this, and the more distressing phenomena which later accompanied the condition; but about the date I have mentioned it became by degrees an agitated state, quite uncontrollable, and in which, amid tears and lamentations, she struggled with wild sexual desires. One or more sexual dreams contributed at these seasons to her self-reproach and sense of impurity. About the sixth and last day she began to lose the erotic impulses and to talk of suicide. At the eighth day she was free from all mental and moral disorder and in possession of her usual entire health of mind. After two years of this torment she gladly consented to lose her ovaries. She made a good recovery, under Goodell's care, but was physically feeble for a year. The ovaries, I may add, were seriously diseased. For three years after their removal she had slight feelings of gloom and headache at the time when the usual term of ovulation would have come round under natural circumstances. Then by degrees she ceased to have any further trouble, and has now been for many years a perfectly strong, efficient, and vigorous woman.

Not all such procedures are so fortunate. Generally, this operation gives temporary or no relief when the melancholia is constant and is merely accentuated by the return of the monthly flow. I know of many, far too many, cases where physicians have advised and women have consented to the removal of ovaries under these conditions, and where no relief has come about in consequence of the operation.

Homicidal melancholias confined to the menstrual epoch are rare.

CASE IX.—Miss C., of Maine, aged forty years, single, in easy circumstances; came of a family most of whom in her generation had been insane. At the age named, being then a large, ruddy woman, in notably good health, she was alarmed to find that she was becoming depressed and melancholic. This condition was absolutely limited to the period of menstruation, and did not begin until she had been flowing for a day. At first the trouble was by no means profound, and there was none between her monthly flows; but later at these periods she began to have furious hysterical convulsions, with visions of men covered with blood, and began to wish to kill some one, and this usually a person dear to her. This state continued for quite a year, and in the interval between her periods she was in a condition which I should call one of melancholy with occasional hysterical convulsions rather than of melancholia. She was depressed by the belief that her family calamity had at last come upon her. But during the intervals she had none of the delusions, nor of the maniacal melancholia, which oppressed the time of the menstrual flow.

At this later period an examination showed that both ovaries were enlarged. They were skilfully removed, with the tubes, by my friend, the late Professor Goodell, and were found to be full of cysts, and one of them to be three inches in diameter, while the other was at least six. The effect of this operation was astonishing. The attacks ceased quite abruptly, the intercurrent distress of mind faded away, and she has had, after nine years, no further trouble of this nature. I have rarely seen a more amazingly complete relief.

More unusual are the cases of melancholia which exist only during a portion of the inter-menstrual period. I saw one such case in consultation many years ago:

CASE X.—The patient, a native of Alabama, was aged about forty-two years, the mother of seven children, and, until her forty-second summer, was in good health. At about this time she had an attack of some kind due to heat. There was great exhaustion, and for a week high temperature, followed by a good recovery, with the common, subsequent sensitiveness to solar heat. Two months after recovery she began to be depressed, and later this grew into typical melancholia, with mild delusions as to past crimes, great self-depreciation, and the like. All of these faded away on the second day of what was a full but quite normal menstrual flow. The recovery was really abrupt and complete. A week after the cessation of the flow the melancholia began again, and within three days became grave. It was at times suicidal, although this never resulted in any distinct effort at self-destruction. This sequence repeated itself many times. I do not know how the case ended.

CASE XI.—The second of these interesting cases was that of an intelligent girl, aged eighteen years, handsome and healthy as to appearance and as to function normal. She came of a family in which there was and had been much insanity, more eccentricity, and some persons of great ability. At the age mentioned Miss K. became, in June, without known cause, furiously maniacal. Within a month this became less and less, and she remained in a state of deep dejection, speechless and motionless, often with a positive rain of tears. As time wore on it was seen that two days before, during, and after the menstrual flow Miss K. was increasingly brighter. After seven months this was so remarkably persistent that at the time of relief she read and wrote letters, talked and heard talk with pleasure, and went back voluntarily to her piano, singing and playing with taste and charm.

The second year found this lady free from mental dis-

order, except for eight days midway between her monthly flows. At this time she was silent, or even speechless, tearful, and full of gloom. Now and then she would write an answer to questions, but considered it wicked to speak. The approach of the menstrual term brought a rapid increase of good spirits, and during the flow and later she was thought to be natural by those who knew her best. At this season she declared that the time of melancholia was never so distinct in her memory as it might have been expected to be. She forgot its details, and seemed to suffer very little from the recollection of what she had gone through. This is a merciful and not a rare feature of many forms of mental disorder. The impression they leave on the memory has the evanescent quality of the mind's record of a dream.

When this case had lasted in this state for two years I saw her in consultation with the late Professor Charles D. Meigs. He was strongly of opinion that she should be bled in the interval, and accordingly she was bled some twenty ounces about ten days after the flow ceased, and was also put permanently on a diet chiefly vegetable. After the first bleeding the sequent depression in the middle of the month was less, and after four successive bleedings, which were done much closer to the time of the expected attack, it became insignificant. I then sent her on a long ocean voyage, during which her convalescence became complete. She died fourteen years after, from an acute intestinal malady, but had never any return of inter-menstrual or other disorder of the mind. I ought to state that long before the lancet was used a great variety of treatment had been resorted to, and that nothing had been left undone which I could devise to break up these attacks.

I am reminded by this case of three occasions on which suicidal failures, causing immense loss of blood, resulted

in rapid relief in melancholias of the gravest types. I have seen another within a very few days of this writing.

I leave these facts, which I have not time here to discuss, to the ingenious interpretation of others. I pass, in this brief summary, to the cases of melancholia which seemed to have some relation to sleep or its phenomena. In the year 1895 I read to the Association of Physicians and Pathologists a paper on the Disorders of Sleep. I then classified the mental phenomena arising out of dreams, or out of what I called the *præ-* or the *post-dormitium*. At this time I drew attention to Baillarger as the only author who had realized the importance of this period, the post-dormitium, in connection with insanity. The great value of these facts, and of those I added, has even yet failed to attract further contributive illustrations. The cases I reported were chiefly of hallucinations of the senses. Since then I have seen a number of instances in which the post-dormitium was haunted by sensory delusions of painful character, followed by an hour or two of really deep melancholia in a waking state. It is familiar knowledge that melancholias are worst on awaking, but instances of this brief melancholia either preceded or not by sensory post-dormitial hallucinations are more rare. A single case will suffice:

CASE XII.—C. J., clergyman, of Connecticut, aged sixty-five years, had, twenty years before, a long and severe spell of simple melancholia. At this later date, in the early spring, he began to have, before he was fully awake, delusions as to voices reproaching him. With these were visions of droll or horrible faces. When he became fully conscious these left him, upon opening his eyes, but for awhile returned if he again closed them.

A few minutes later the sounds and visions left him entirely, but for two hours he was the victim of a melancholia so deep as to be once or twice almost overwhelmingly suicidal. About 11 A.M. this all passed away, and he became so well as to be able to attend competently to important duties during the rest of the day. These phenomena lasted for years at intervals, and finally ended in senile dementia of the passive type.

I have also seen remarkable instances of temporary but really profound melancholias which were the outcome of dreams. I recall two such cases. It may answer to relate one. The borderland of unsoundness of mind is sometimes subject to a great increase in the number of dreams, and these may be so constantly horrible or terrifying as to be a warning of the coming mental disaster, as has been more than once pointed out, especially by Baillarger. It is, however, uncommon to find the dream resulting in an attack of agitative or simple melancholia. Abnormal fear, irrational anxiety, may come of it, but not often distinct melancholia.

CASE XIII.—Mr. L., aged thirty years, an engineer, consulted me on account of nocturnal attacks. Except that he had frequent ophthalmic megrim, he was in good health and free from evil hereditations. After a period of great commercial anxiety he had one night a dream of falling from the trestle of a bridge. He awoke sweating and in a state of wild agitation. He said that he rose, lit up the room, and began to walk about. His affairs seemed to him hopelessly involved; he figured himself as weak, incapable, and untrustworthy. Life seemed unendurable. He cried like a child, and at last drank a tumbler of brandy and fell asleep. This torment came again at intervals of weeks or months, and later on became frequent.

The dreams varied, but the results were the same. A summer in the woods brought relief, and an ocean voyage finally rid him of this disorder.

I shall close this too condensed statement of certain of the unusual ways in which melancholias arise with a single example of its production during digestion, in a case of intermittent glycosuria:

CASE XIV.—H. R., aged about forty years, a scholar of uncommon ability, consulted me for a condition then and since unknown to my experience. He had been for years a dyspeptic, suffering much with a sense of weight at the epigastrium, with wind and excess of acid. Within a few months the dinner at 7 P.M. was followed by the usual distress, but later, about 9 P.M., by deep dejection, indifference to life, desire to be alone, tears, and what he called “fragments of delusions,” easily disposed of by the reason, but apt to return. This condition passed away about 12 at night, and he usually slept well. These attacks became of daily occurrence and were more or again less severe. It was soon found that he had sugar in his urine; that the quantity was least on rising from sleep in the morning; that it increased after meals, and was largest about two or three hours after dinner, the time at which his melancholia arose and deepened. A long course of skimmed-milk diet was of great service, and later, by eating a carefully chosen diet six times daily, he did very well, escaping for a long period both the glycosuria and the mental disorder, which appeared in the evenings and seemed to be related to a rise in the amount of excreted sugar. He died of double pneumonia some years later.

I recall no other case of melancholia clearly related to digestive troubles, or to glycosuria; nor do I think that ordinary cases of the mental disease suffer more after

meals. The early morning hours are, as all alienists know, the time of greatest misery; the chosen hours for suicidal thoughts or efforts. When this sequence is reversed and the evening is the time of gloom we have, as a rule, to deal merely with the dejection met with in some neurasthenics or hypochondriacs, or with an hysterical simulation of melancholia.

CHAPTER III.

IRREGULARLY RECURRENT MELANCHOLIA WITH LONG INTERVALS AND NOT IN APPARENT RELATION TO FUNCTION.

PERHAPS there is no more reason to be surprised at melancholias which recur after a day or days of sanity, than as to those which return after months or years. In cases like that quoted at the close of the last lesson the regular repetition of melancholia in connection with the time of digestion tempts the reason with possibilities of explanation; but in the cases to which I now refer, and shall illustrate with a striking example, no form of explanation as yet seems available. Nevertheless, it is in the careful study of such melancholias and their sequent intervals of soundness of mind that we are offered the best chance of discovering the agencies which can so quickly develop a mental disorder.

The following case sought advice while I was writing this paper. It is an example of recurrent melancholia of brief duration, returning every two or three days, and lasting four hours to twenty hours:

CASE XV.—C. E., retired merchant, aged sixty-five years, married. The father was healthy, and died aged eighty-eight years; mother healthy, died aged eighty-four years. Three sisters are alive and well. Three brothers died aged respectively seventy-five, seventy-four, and thirty-eight years; one nephew had melancholia with delusions.

Had had typhoid fever in 1870—no sequelæ; habits

good ; no syphilis. For fifteen years has been liable to feel depressed when his business became troublesome, or in commercial crises. His general health is unusually good. The heart and arteries are far better than is common at his age. He is clear of head, competent in business, sleeps well. His appetite is good ; his bowels regular. Is liable to occasional indigestion, with non-acid eructations. He has normal reflexes ; his station is perfect. The urine shows no albumin or sugar. The morning urine, on standing, presents a small deposit of free uric acid and urates. The attacks I shall describe have no relation to the meal-times. When away from home they are fewer in number, but except as to this he knows of nothing which affects the number or severity of the spells.

About five years ago Mr. E. began to have brief attacks of mild melancholia. They came at irregular intervals—weeks apart. A year later their frequency and intensity increased, until ever since they have continuously recurred two or three times a week. The longest interval is five days. They may repeat themselves every day, on two to four successive days, or return upon alternate days with regularity. The seasons do not affect their number, nor does the time of day. He may awaken in an attack ; he may have one at evening, and lose it in the sleep, which it does not seem to make less sound. He can neither avoid these spells nor lessen their force or shorten them. From the time he first feels the attack or sense of dejection to its climax about half an hour elapses. It passes away even more abruptly at times, but commonly is an hour in leaving him, dating the time from a sense of distinct relief to full possession of his natural cheerfulness.

While thus afflicted he is melancholy, irritable, turns over and over in mind every possible source of annoyance, even conjuring up the worries of others with which to

perplex himself. At these times he must be alone; will see no one; contemplates suicide, but has made no suicidal attempt and does not believe he ever will. This dejection he describes as profound, and says that hope seems dead, affection valueless, and life a torment. He has no delusions of sense; then there is a feeling of relief, and, as described, the "cloud passes," and he is, as usual, gay, happy, and equal to any sport or work.

To illustrate this singular case, I give his own record of twenty-two successive days in midwinter: twelve were free from attacks; on three he had brief, mild spells. He had six sharp attacks, and one of great severity both as to length and excess of melancholy.

Prof. Samuel Jackson described a case not purely or very distinctly melancholia, which recurred alternate weeks with sane intervals, and ended in dementia. I can find nowhere, however, a melancholia which repeats the phenomena of the case I have given.

This gentleman returned January 12, 1897, to permit of study of his days of melancholia as compared with the normal intervals. Unluckily, but as is usual with him when away from home, he had fewer attacks—in fact but two in the fortnight of his stay.

Study of his secretions by Dr. Pearce began by an examination which gave the following results: He was feeling well; pulse 72 and respiration 18; temperature, 98.5°; blood-count, 4,200,000; hæmoglobin, 90, at 11 P.M.

The urine for twenty-four hours was over the normal, as he weighs 140 pounds; amount, forty-five to fifty-five ounces; specific gravity, 1020. No abnormal constituents except amorphous phosphates were thrown down after the urine stood a few hours. At this time he looked well and ruddy, and was, as usual, gay and cheerful.

On January 20th he had an attack: notes taken at 10 to 11 P.M.

He had been, as he said, "fine" until late this afternoon, when he began to feel badly. Did not wish to speak to anybody or exert himself. Noticed nervous cough and accumulation of sticky mucus in throat and feeling of depression about the "brain" and of pressure over sternum. Did not care to go to "opera" on account of this "cloud" settling over him. Went to bed and slept, but awoke in two hours in a dreamy state with feeling of despair and discouragement, the "cloud" or haze gradually falling over him until the mental depression was almost unbearable, and he was afraid he would be an "imbecile." Unnatural dread of the little preparation to go home. Could not, through any effort, throw off the feeling.

When seen at 10.30 P.M. the eyes were dull and red, the pupils equal and responded sluggishly but equally; station good; knee-jerks normal; respirations regular, 18 per minute; pulse full, compressible, 72 per minute; tongue clean and moist; temperature subnormal, 97.6° F.

January 21st, reports attack as passing off while we were talking together at 11 P.M. Slept well; awoke at 7 A.M. Feels "fine." Says he could do business to-day better than usual, being clear and competent. Four ounces of urine were saved during the attack.

During the day of onset the quantity of urine fell to thirty-three ounces. In another minor attack it was in excess—fifty-five ounces.

While in mental health he passed rather less urea than is usual; in both the attacks it was materially lessened. The percentage of uric acid was decidedly increased in the more severe attacks, but not in the milder. Indican was certainly present in larger amount in the urine of the

melancholias than in that passed while free from depression, when only a trace was detected.

I complete this notable case with a table of the days of melancholia noted during 1896:

In January there were nine bad days; February, six; March, ten; April, thirteen; May, eight; June not given, but said to be a bad month; July, ten; August, five; September, three; October, nine; November, five; December, eight. Evidently the spring and summer months, up to August, were the worst.

Unfortunately, this gentleman was called away before he gave us any further opportunity to study his case, and it were unwise to draw conclusions from these imperfect chemical analyses.

CHAPTER IV.

SOME DISORDERS OF SLEEP.

WHEN dealing with organs or functions the physiology of which we, in a measure at least, comprehend, it becomes easy and pleasant to discuss their alterations from health; but as regards sleep we know little. The wildest theories have been entertained concerning it; and, after all, we are simply driven to believe that it is a state of the nerve-cells—and why not of the nerves?—in which they become functionally actionless in a variable degree. Whether this be true also of the other cell-structures of the body we do not know; and sleep may be a universal function, as would seem reasonable to those who believe that plants sleep. It is sure, also, that the sleeping brain contains less blood, or that it circulates less, than the brain awake, and this is the limit of what we know.

The disorders of sleep are many. I have found myself driven to choose among them, and I shall limit myself to a less known group, to some members of which I was the first to call attention.

In 1876¹ I described several of the morbid states of sleep, and again wrote of them more freely in 1878.² In 1882, in my lectures on Nervous Disorders of Women, I dwelt at greater length on the symptoms in question, as well as on others which have been much

¹ Philadelphia Medical Reporter, 1876.

² Virginia Medical Journal, 1878.

discussed of late in the journals without notable additions of value.

In making choice of how I shall treat of sleep-troubles I have been influenced somewhat by the fact that certain of these it has been my fortune to see and to study more than I have the better known phenomena of dreams, somnambulism, and the like.

The approach to the unconsciousness of slumber, and, too, the return from it to the world of volition, may be medically considered as part of sleep, and, as I shall show, these periods are often disturbed by certain very interesting symptoms.

As we are falling asleep the senses go off guard in orderly and well-known succession—this interval I desire to label the *præ-dormitium*. When we begin to awaken, and the drowsied sentinels resume their posts, there is again a changeful time, during which the mind gradually regains possession of its powers—this interval I may call, in like fashion, the *post-dormitium*.

The Relation of the *Præ-dormitium* to Insanity.
In the borderland of coming slumber, when we are not yet overwhelmed by its full power, the steadying contradictions of the external world are, in a measure, by degrees cut off, whilst the will still holds a slowly lessening rule. It has long been known to alienists that the *præ-dormitium* is apt to be invaded by hallucinations in those who are becoming disturbed in mind. Every student of himself knows, too, what a fairy country for visions is this intermediate state. Since, in the sound, it is the time for castle-building, it seems natural that, in the disordered, it should serve to foster dangerous hallucinations, and that, in rare instances, these should be limited to the period in question. Bail-

larger is the only author who has studied with any care the relation of the præ-dormitium to insanity. Of this he says:

“The organs of sense ceasing to transmit to us exterior impressions, the control of our ideas escapes us, and whatever rises appears, as it were, spontaneous ; at times vague or confused, fantastic forms succeed one another, and we have of it all but a half-consciousness. At times more distinct forms appear, and we are present, as it were, at a strange spectacle in which we take no active share, but which leaves distinct traces on the mind. Any exterior intervening impression causes these visions to vanish. A sudden noise, or touch, or light awakens fully the senses, recalls attention, and these phantoms are effaced.”¹

The period now in question is of great psychological interest; nor have the laws which control it been studied enough. In childhood it is certainly the time of easily attained visions, and in the imaginative this is especially the case. As years go on the power to fill this magic interval with what we will to see grows less, and in later years is materially impaired or is altogether lost.

I have been at some pains to learn to what extent the capacity to call up, control, and dismiss visions exists in the præ-dormitium. The ability to project visually at will on the screen of consciousness greatly varies with the individual. Generally in youth it is possible soon after closing the eyes for sleep to evoke visions. Some children can control these visions. They see what they will. This was at one time the case with me. Others may will in vain. They see nothing or only the crude stuff of dreams, or else something they did

¹ Baillarger : *Annales Méd. Psych.*, vols. v. and vi.

not seek to summon. Few can hold these phantoms. They come, they go, change and vary under mysterious influences, uncontrollable by the will. Such is apt to be the case later in life for all who continue to be able to possess the power.

This is hardly the place to go much further into the physiology of the præ-dormitium. I speak of it only because it is the threshold of sleep and full of interest to the alienist, and, indeed, to the neurologist.

Even this brief study of its peculiarities reminds one of the prolonged condition into which we are brought by the action of moderate doses of such drugs as mescal—*Anhelonium Lewinii*. The original study of this drug by Professor Prentiss and a later examination by the author¹ have made clear the remarkable resemblance of mescal intoxication to the natural period I have called the præ-dormitium. I speak here with assurance only as to myself, for, as I have said, we as yet need a full study of the psychology of the states which precede and follow slumber.

In a long series of interesting cases Baillarger shows that certain persons, otherwise still sound, are liable to have, between waking and sleep, hallucinations which long precede the outbreak of insanity. He describes instances of such hallucinations of sight and hearing as lasting from one to three years, and ending in grave mental disease. These were usually voices or visions, fading when the eyes were opened, as occurs with mescal visions. In one case there was something like the sense of a blow on the head, and then on the bed, but nothing comparable in this direction to the phenomena

¹ British Medical Journal, Dec. 5, 1896.

of sensory shocks to which I shall presently call your attention.

I have myself seen illustrations of the facts mentioned, and I speak of them here because this is ground we rarely go over in our examinations of patients. It may possibly be found that valuable prognostic indications as to insanity are to be gained by examination of the *præ-dormitium*.

Before passing on to other matters I may say that generally, as I have known them, these prodromes of insanity were connected with eye or ear alone. In but one case was olfaction concerned. I will content myself with a sketch of it:

CASE XVI.—Mrs. C., aged forty years, of a neurotic family, all liable to neuralgic headaches. One brother died of ataxia. Convulsions in infancy were common to all five brothers and sisters, none ending in epilepsy. Mrs. C., who was well except as to headaches, had a fall which injured her nose. The shock resulted in persistent headaches, without other cerebral trouble save complete loss of smell. Two years later she had, but only on going to sleep, a sense of horrible odors, which were fecal or animal and most intense. This lasted several months, and then were added sounds of voices, which were at first vague, but at last accusative, and soon were heard in the day. The case ended in melancholia with delirium of persecution, during which the trouble as to smell passed away.

CASE XVII.—A. C., a clever lad, of exceptionally able and normal descent, became insane at eleven years of age, and was long maniacal and often homicidal. For some months before this outbreak—which was acute—he was troubled by seeing animals on his bed before he fell asleep. Opening his eyes routed them at once. The condition

seemed to have none of the peculiarities of the night-terrors of childhood.

I am tempted to add the brief notes of another lad's case, in which the same period was a time of singular disorder of mind. It is, of course, known to many of you that the bromides may in some persons (and notably in the young) occasion, like mercaptan, profound melancholy or maniacal tendencies, which in several instances in my experience have been homicidal, or at least madly destructive.

CASE XVIII.—The lad in question, an epileptic, aged eleven years, was said to become homicidal from bromides. I was skeptical enough to test the matter. About the seventh day of using full doses of lithium bromide the trouble showed itself in the *præsomnic* time as visions of himself killing other children. They annoyed him greatly, so that he strove to keep awake; but at last, tired of the unnatural effort, would fall asleep, with too brief an interval to allow of his being disturbed again. After several nights of like distress the homicidal tendency broke out in abrupt and dangerous violence during the daytime.

There are epileptic cases in which inhibition of fits causes homicidal explosions which cease when the fit comes on, and do not recur for a time, whether bromides are continuously used or not. In this lad's case the fits did not lessen the tendencies to destroy or injure others. These lasted as long as the bromides were given. I think Echeverria mentions like cases.¹

There exists also, I may say, a group of cases (not in the books) in which the borderland of sleep is haunted

¹ Also the author. See On Exceptional Effects of Bromides. Transactions of Association of American Physicians and Pathologists, May, 1896. University Medical Magazine, June, 1896.

by hallucinations for weeks or years without their ending of necessity in mental disease; but it is quite impossible for me here at this time to dwell on these interesting cases, of which I have seen a few, and but a few. In no respect do they differ from the like cases reported by Baillarger in which insanity resulted, save in the fact that it did not. Voices were heard or distressing visions seen during the *præ-dormitium*, and at no other period. With time and due care these visions faded away. Two of the half-dozen I recall were hysterical women; two were men in busy affairs; and one, the worst, a woman of thirty-seven years, was, I think, preserved from insanity by the loss of her ovaries.

The corresponding time, which comes after sleep and before full wakefulness, is also said by Baillarger to be troubled in some by hallucinations, but of this I have no experience;¹ nor does he speak of it as common. Tuke also has reported cases.

There is yet another and stranger mental condition experienced, though rarely, in the *præ-dormitium*. This is a suddenly acquired and sometimes persistent sensation of fear or terror without any sensory hallucination. For our emotional states we have usually a cause, or at least think we have; but what I now describe is an emotion without known parentage. Children may exhibit this continuous fear after the scare of a dream, like the echo of an emotion the cause of which is over.

Sometimes in adults this lasting sense of alarm is the product of a dream. The victim awakens and continues even for hours to feel the fear to which his dream gave

¹ See, however, as to this, my own later experience—chapter on Recurrent Melancholia—in this present volume.

rise. He is wide awake; lights the lamp; reads, or tries to; but is still fear-haunted, reason as he may. The patient who is liable to this fear may also be subject to attacks of pure fear without a dream-cause, and arising in the time between waking and slumber. He has then no dream. Of a sudden, whilst half-awake, the man is afraid. It is pure fear, such as the insane have at times. I append a case from my first paper. Both forms of the trouble here mentioned were felt. The case is given as stated by the sufferer, a scholarly, much overworked man, with no obvious habits, hereditations, or disorders to explain his condition. He says:

CASE XIX—"About the year 1871, being then fifty-five years old and in sound health, I was troubled with what I understand to be 'night-terrors,' but unlike any I have been able to hear of. Upon retiring I could generally tell whether or not I should have this trouble during the night. These premonitions were: a difficulty in breathing, not being able to draw a full breath, owing, as it seemed to me, to some obstruction in the lungs; intense nervousness; turning from side to side.

"I would fall asleep and have vivid dreams, and almost always upon the same subject, the purport of which was, that after long absence from home I returned and found that some one dear to me had become idiotic.

"The most painful attack of this kind occurred in 1872. That night I dreamed that after a long absence I returned, and, upon approaching the city, I saw upon a steamboat my aunt. She had become crazy in my absence and was under the charge of keepers. As I neared the boat to speak to her she leaped overboard and was drowned, and her body, with a fearful idiotic leer upon her face, floated past me so close that I could touch it. I awoke with a sudden start, trembling from head to foot; and, although

in a moment I realized that it was but a dream, yet the feeling of terror, instead of leaving me, rather increased. I was obliged to rise, light the gas, and leave the room and remain for several hours in an adjoining one. I then returned to bed and slept until morning; but the next evening, when it came time to retire, the recollections of the past night were so vivid, and the intensity of the mental suffering so clearly before my mind, that I could not force myself to retire. My reason told me that this was a foolish feeling, and that I ought to conquer it; but after a severe struggle reason gave place to this undefinable feeling of terror. That night, and for several nights afterward, although I was not addicted to drinking, I drank strong liquor until my senses were clouded, and this I did intentionally, otherwise I could not have retired.

“During the daytime, when thinking over this fearful attack, I concluded that if it were given me to choose between passing one such night and being deaf, blind, or lame for life, I should choose the latter; nay, I felt that even death itself would be preferable to such another night. I have never since experienced such intense suffering, but have passed through it many times in lighter forms.

“This fall (1875) it took a different turn. Upon retiring I was unable to keep my eyes closed, because the moment I closed them a feeling akin to fright would cause me to open them.

“This was like, but incomparably less than, the dream-evolved terror. Nevertheless, it was bad enough. It did not come if, sitting up, I closed my eyes; but to lie down and close them was often enough; or, if the emotion did not then arise, it seemed to burst upon me just as I was conscious that sleep was near. These attacks were the worst. I was afraid—and of nothing. No reasoning helped me. As I am by nature, despite my professional life, hardy and courageous, I was rather ashamed of being

fearful of nothing, knowing that in battle I had had no more fear than others, and none that disturbed me.

“After tossing endlessly for hours I would at last sleep for an hour or more with the sense of sleeping ill. If I had a bad bout, I sometimes awakened with my mind not clear and feeling as if I needed effort to steady it.”

Despite these alarming symptoms this gentleman got well after a summer in camp in Maine.

Others have described to me this state of fear in the præ-dormital condition. Says one:

CASE XX.—“I have had, like others, nightmare; but this comes over me while I am quite conscious, and of this I am sure. Whilst yet capable of mental analysis and just pleasantly drowsing, I simply and abruptly realize that I am afraid. I feel it coming. I am not paralyzed, as by nightmares; I can move. If I fully sit up, it is over; but if I delay to do so, and it catches me, it stays on for a minute or two after I am completely awake and master of myself. I sometimes lie still with open eyes and seek to know why I fear, or reason it over, but nothing relieves me. The fear goes by degrees, but if at once I lie down again and close my eyes it comes back.”

Another mental state, somewhat akin to this last (for fear and anxiety are near akin), also occupies the præ-dormitium. It is always an associate of bad sleep or of insomnia, and consists in a series of unreasonable fears and anxieties. I will let a sufferer tell his story as he wrote it for me.

CASE XXI.—This sufferer was fifty years old, of nervous temperament, a man of restless intelligence, anxious always, successful past the common, free from disease, endowed with a perfect stomach, and habitually insomniac. He called three hours a good sleep, and for years lived on

this and an afternoon nap of an hour. Now and then his restlessness got worse, and was the insomnia of over-vigilant and excited centres, which furnished a succession of anxieties, each in turn capable of inhibiting sleep. He says:

“This trouble haunts the time close to sleep. I lie down; am easy, and assured of sleep. Suddenly, I think, is the gas turned off properly? I get up and look; return to bed; get up again, and so on. At last I become anxious as to my son, aged six. Is he safe in bed? Will he fall out? My wife goes to see, reassures me, and then I go myself, and go a dozen times. Next, it is the furnace, or the locks, or fear of fire, until, worn out, I am surprised by sleep. It seems as if this thing waits for me at the gates of sleep, and I can understand that just then one's fancies may run wild. But once awake, the thing goes on until I am ashamed of the demands made upon my wife, and, too, of my own folly. I know of others who have the same trouble, but never in the day season.”

Sleep-numbness. Nocturnal Paresis or Paralysis. As sleep-numbness, this disorder has become familiar since I described it in February, 1876, and later more fully in my book in 1882. Since then, Dr. Andrew H. Smith, in this country, and Dr. Saundby, in England, have written of it anew; the former as an undescribed neurosis, and the latter without full knowledge of what had already been written. Dr. Saundby thinks I appear to have recognized this condition, but is of the opinion that the name I gave—nocturnal hemiplegia—in view of the occasional association of temporary loss of power, is not very appropriate. In fact, I described pronounced cases chiefly, and their duration had nothing to do with the nomenclature.

In general, functional day-numbness (as I and others have described it), whether neurotic, anæmic, gouty,

diabetic, atonic, or asthenic, is apt enough to repeat itself at night in sleep. But there are people who never have day-numbness, and who are, nevertheless, liable to awaken with this interesting neurosis.

Definitions of it do not admit of sharp boundaries. It may be local, transient, a slight numb feeling, a faint tingling of the fingers, of a leg, or of one side; or else it may be intense, and present us with paresis and real defects of the touch- and pain-sense. In another case it may show itself, though rarely, as an alarming monoplegia, or as a distinct hemiplegia, lasting but a few moments, or growing worse during hours. Again, it may involve the whole body, but is then apt to be less severe than are the hemi- or monoplegic forms. I have seen several of them in one person; at this time slight numbness, and at that hemiplegia, alarmingly positive, with marked loss of power and with lessened sensibility. For Dr. Andrew A. Smith, waking-numbness is a paræsthesia at the exit from sleep, and "in this," he says, "there is nothing added, and nothing taken away." But these subjective states, which to-day are mere tingling or formication, may to-morrow deepen into the semblance of hemiplegia, with distinct loss of sensation. It is only a question of degree. The neurasthenic, the hysterical, the tobacco-poisoned, the gouty, the dyspeptic, are liable to awaken with numbness, tingling, dysæsthesia of a part, or of both hands, or of a side. It goes off in a few minutes. More rarely there is a distinct weakness of an arm or side, with dysæsthesia, very rarely with complete loss of feeling. And so it is that we may have various degrees of disturbance from faint tingling to profound temporary dysæsthesia, and defects of power from paresis up to

a brief simulation of paralysis. Were the worst of these simulations to last, they would be grave enough, and, in fact, it does sometimes happen that such states as I describe may even deepen in intensity after the patient is fully awake. In some patients they recur night after night, attack both hands or both sides on successive nights, or occur at intervals for years. I may add that I have sometimes seen this symptom in men apparently vigorous, and that it also occurs, now and then, in those who have multiple cerebral aneurisms or endarteritis. I have seen it, too, over and over, in convalescent hemiplegics. They awaken with the palsy worse, a functional condition being for a time added to that which had an organic cause, or the sound side suffers, to their great alarm.

I give a physician's story of his attack:

“ Excessive work, with double abuse of tobacco (smoking and chewing), had caused day-numbness, which troubled the ulnar territories most. One morning I awakened with transient numbness of the whole left hand, with no true loss of touch. A week later I had, on awakening, dysæsthesia, with pricking of the whole right side, including face and tongue. I arose, found leg and arm weak, examined sensation in the finger-tips and recognized the fact that with scissor-points applied to the finger-cushions I could not be sure of them as two at one-third of an inch separation. I was about to send for a physician, when the sense of tingling becoming worse in the extremities, the dysæsthesia grew less, and in two hours I was as well as ever.”

It is of interest that he soon after saw a case of waking-numbness in a tobacco-using patient, whom he confidently reassured, stating his own case. In fact,

however, the patient owed his numbness to unrecognized diabetes, and it ended in gangrene.

The history of numbness in all its grades points to a central origin, but that it may arise otherwise is also clear. In some cases of neuritis I have seen night-numbness as a first, a transient, and a repeated symptom preceding the pain by several days.

Some years ago, whilst writing my book on Nerve Lesions, I froze my right ulnar nerve at the elbow with alcohol at 0° F. For ten days afterward I had more or less discomfort, and at times acute pain, but especially, on several occasions, a positive numbness of the ulnar territory with which I awakened. It passed off with friction in an hour, but was much worse than the occasional day-numbness which my somewhat rash experiment created. Yet, for a time, it was purely a waking symptom and faded swiftly. The more profound examples of hemianæsthesia with paresis as post-somnic states are, I think, most apt to involve the right hemisphere. I recall no instance of aphasic accompaniments in the rarer left brain disturbances. In their varieties these symptoms probably represent functional irritations or inhibitions of quite various parts of the brain; unlike their hysteric related states, they are felt in the face as well as below it, and are clinically of kin to the functional anæsthesias and pareses of certain migraines.

In some cases, notably in hysteria, waking-numbness is associated with pain in the parts affected, or there are also paræsthetic expressions, as sense of constriction, of elongation, or of enlargement of limbs, etc. At times the sensation resembles the furious formication of aconite-poisoning.

In Dr. Ormerod's paper¹ on numbness (which is the best of the English essays) he speaks of the pain suffered by some of his cases, and as to this he is quite correct. In fact, there are those who awake with pain in arm or leg, or both, so intense as to make the accompanying numbness seem of little moment. Pain as an accompaniment is also mentioned by Sinkler, but not as being severe; whereas it is in some instances of waking-numbness very great. I add two or three cases. The first, again that of a physician, I give as he wrote it. He says:

“The preparative causes of my present state were excess in tobacco and a practice which left me no rest. Then came a domestic calamity, and I broke down with distress in the occiput and an amount of suddenly developed physical feebleness which annoyed me. I could not walk up three flights of stairs without resting. My heart became rapid—90 to 100; my temperature 97.4°, and at night 98°. I was struck, too, with the weakness of my bladder, the urine merely falling as it emerged. All this was in December. In February I began to have night-numbness, and would wake in the night with all four limbs numb. The worse attacks were those at waking in the morning late. Early in the night the symptoms were less notable, or else affected one limb only, or one side. At times it was mere tingling; at others, positive lessening of sensibility to touch and pain. When this was the case the limbs were for a time paretic; on one occasion so much so that I fell on getting out of bed. The trouble has never lasted more than thirty minutes, and usually went off with great tingling, as of a limb asleep, as is said. After March I began at times to have numbness in daytime, but rarely so intense as to disturb feeling. The tingling

¹ St. Bartholomew's Hospital Reports, 1883.

occasionally affected my whole surface, and was apt to begin around the mouth."

In this case the symptoms were neurasthenic, and absolutely no other cause could be assigned for them. Recovery was complete. The next cases are from Dr. Féré,¹ and are certainly hysterical and of great interest.

CASE XXII.—"Mrs. V. came to consult me, for the first time, at the Salpêtrière on January 12, 1885. She was accompanied by her mother, who was over sixty years of age, but still very agile, and looked much younger than she really was. The mother had a painful ovarian spot with slight anæsthesia on the left side. Although the menses had ceased nine years previously, she had been subject to migraine, with attacks of melancholia, and occasionally convulsive fits. The father, who had been a drunkard and profligate, had quitted the house twenty years before, and no one knew what had become of him. A brother of the father had died in prison while undergoing confinement for swindling. Mrs. V. had two sisters born after her. The one had died of convulsions connected with teething at the age of eighteen months; the other died of convulsions when only six months old.

"Mrs. V. had been a precocious child both physically and mentally. She had walked and spoken at a very early age, and had learned very rapidly at school. She has never had convulsions nor tic, but from the age of six has suffered from frequent migraine, followed by vomiting, and during her whole life her sleep has been troubled by nocturnal terrors and nightmare. Menses began when she was twelve. At the age of seventeen she had attacks of chorea in consequence of worry. This lasted three months, and chiefly affected the left side. At nineteen she was married, and had her first child, a boy, when twenty-three.

¹ Brain, October, 1889.

This child died of convulsions on the eighth day. In the following year she was delivered of a child stillborn. During her pregnancy she had anorexia and vomiting, which ceased spontaneously in the fourth month.

“Since her chorea Mrs. V. has always enjoyed good health, and has had no distinctive nervous outbreaks until about three years ago. At the time her husband died she suffered severe pecuniary loss. This induced insomnia, followed by loss of appetite and emaciation. By hard work her health became pretty good. About two months ago she had a very abundant metrorrhagia. A few days after this mishap she began to feel constrictive pains in the head, extending over the whole of the cranium, but predominating in the postero-inferior region, which appeared, moreover, to be the seat of a constant pressure. From time to time she heard a cracking noise in the back part of the neck, which resounded in the occipital region of the skull. At nightfall she was seized by painful fancies, of ruin for her mother and her daughter, of illness for all her friends; at the same time she was a prey to unusual pusillanimity and indecision. Her sleep was disturbed by dreadful nightmares. She was widely awake toward six in the morning, but was incapable of making any movement. She suffered from distention of the bladder, but could not even think of getting up. Her limbs seemed numb to her, and as if wrapped in cotton. She appeared to know the position of her extremities only, and it seemed to her as if the greater part of each limb was wanting, and her hands and feet had been brought up close to her body. The sensation is analogous to that experienced by amputated persons, who say they feel only the extremity of the absent limb. She could make no movement whatever. When daylight was admitted a sensation of numbness and pricking gradually appeared in the extremities of the fingers and toes. These sensations, occasionally very

painful, preceded the return of ability to move. About eight o'clock the patient could get out of bed, maintain herself in a standing position, and make movements of the arms. The complicated movements of the fingers, however, remained almost impossible. She was thus incapable of fastening her clothes or of taking up a pin. When she had moved her arms and had been rubbed a little her fingers became more supple. From the time she awoke until the nearly complete restoration of movement took in general about three hours. One day, when left in a dark room until about ten o'clock, she was found in the same helpless condition. Movements of the head and neck and of articulation were not affected. On examination no modification of the external aspect of the limbs could be determined. She suffered pain in the region of the left ovary and had slight anæsthesia on the same side. The contraction of the field of vision was tolerably extensive, and the patient was insensible to violet rays in the left eye. The iris of the left eye was of a deeper brown and the pupil not so large as on the other side. Under the influence of bitters, iron, bromide of potassium, and hydrotherapy combined with static electricity all these symptoms disappeared in the space of three weeks, with the exception of pain over the ovary and the hemianæsthesia. This case was, of course, distinctly hysterical."

CASE XXIII.—Mrs. P. She complained of sudden shocks in the head which awoke her abruptly. These occurred by night four or five times. Finally came other troubles which raised her inquietude to a climax. When her sleep became broken, toward four or five o'clock in the morning, she found that she could not move any of her limbs. This general helplessness did not last very long, for after a few minutes of effort she recovered power of movement in her right hand and foot, but for the limbs on the left side prolonged friction was necessary. This paresis was accom-

panied chiefly on the left side by a sensation of painful numbness and pricking. The hand especially was cold, and the fingers appeared to diminish in volume, the rings hanging quite loosely.

This helplessness, which at first persisted only a few minutes, was in a month's time prolonged for an hour or more. The patient could not raise herself out of bed until some one had rubbed her energetically. Even then she would remain for many hours incapable of making any delicate movements or even of simply fastening her dress. When the paralysis was at its maximum the patient declared that she was no longer conscious of the existence of her own body; that she was, to use her own words, a *pur esprit*.

Under the influence of cold douches repeated twice a day at regular hours and a tonic treatment of iron, nux vomica, and arsenic, with bromide of potassium given every evening in moderate doses—one to three grammes—her condition rapidly improved. The paralytic numbness on waking diminished at once in duration and then in intensity. At the end of fifteen days it had almost completely vanished. The sensations of shocks in the head, which had caused the patient to awake, disappeared in turn. The anorexia and pains resisted longer; at the end of six weeks the pain in the tendo-Achillis still persisted, but in time it too disappeared.

It is very clear that a vast range of disease or disorder seems capable of causing night-palsy in its variety of degree. As concerns the cause, there is much difference of opinion; some look upon it as due to rare somnic conditions of the vessels of the brain, while others, like Féré,¹ attribute it to a deficiency of physiological excitation—"paralysis from irritation."

¹ Brain, October, 1889.

Reflex it surely is at times, and purely local or peripheral but rarely.

It is needless to discuss treatment. It means anything from the treatment of neurosis to that of gout, neurasthenia, habits, renal insufficiency, diabetes, and what not.

Sleep-ptosis. Another form of annoyance to which I have time to give but a passing notice is the ptosis of sleep. Of this I nowhere find mention. The patient awakens with palsied lips; lifted, they fall. In some instances it lasts a few minutes or longer, or else before the disorder repairs itself sleep returns, and in the morning the patient has it anew, or awakens without it.

I append two cases which came under the care of Dr. de Schweinitz:

CASE XXIV.—One was that of a woman, aged sixty-five years, as I understand in good health and not hysterical. There was some irritation of the lids and slight general conjunctivitis, also there was a slowly ripening double cataract. As the vision was still fairly good she read much, and if she used her eyes freely in the evening was sure to experience the following trouble: waking in the night, she found that her eyes could not be opened by the will. After they were forcibly opened they remained controllable by volition until after sleeping again, when the same phenomena recurred.

The notes are not complete, and although she describes the ptosis as spastic, it seems to me to have been only a night-palsy of temporary duration. A somewhat similar case was observed at my clinic a few weeks ago, and I have seen a number of them.

CASE XXV.—J. C., aged twenty-nine years, a widow, was in absolute health after a childless marriage of four years. Soon after her husband's death she began to suffer with sexual dreams, and later with these and hemianæsthesia of decisive type without loss of power. A year from the beginning of her widowhood she awakened thrice in one night with paralysis of the lids. There were no eye-troubles, but the lids as she awakened could not be lifted at will. When raised by a finger they fell flaccid, and only by degrees, in an hour, recovered tone. This trouble, unknown to the day, continued for many months, and, indeed, disappeared only when this and all other symptoms were promptly dispersed by a second marriage.

In another case the ptosis was like the emotional spastic ptosis of hysteria we see in waking hours, and well known to neurologists:

CASE XXVI.—A woman, aged sixty-seven years, in good general health, but full of notions; for fourteen years she has been the subject of stubborn retinal asthenopia; the eye-grounds are, however, healthy; there is a considerable degree of hypermetropia and astigmatism, together with insufficiency of the internal straight muscles. Each night, for a long time, usually between twelve and two, she has been awakened over and over by a feeling that her eyes have closed spasmodically. She arises, forces them open with difficulty, and bathes them, "because the lids feel as if they were sticky and would glue fast." The phenomena repeat themselves, but never by day.

This case proved, I believe, very obstinate, and is only notable because it is of nocturnal origin alone.

Sleep-pain. I add a few words as to what is, for rarity, a medical curiosity. I find in my note-book some half-dozen cases of pain in the legs, never known

to the day, and needing sleep as a conditioning factor. Whenever I have spoken of this obscure disorder to a patient he is apt, if intelligent, to say: "No, not pain; it is distress." It occurs in middle life, or later, and, without previous disease, comes on slowly. In one case it followed typhoid fever. The cases are alike. A man is well in the day; walks, works, does as do others. Some time after he falls asleep he is awakened by aching in the legs, from the sole half-way to the knees. There is but one remedy—motion. He rises, walks for ten minutes, is eased, goes to sleep, and in an hour or two awakens to feel the distress and repeat the relieving exercise. There is no unusual heat or cold; nor any abnormal appearance. The matter is unpleasantly simple, and there is no clue to a cause.

The case I now quote from my note-book I saw two years ago. It is typical of a rare condition.

CASE XXVII.—J. C., aged fifty-eight years, farmer, Kentucky; married, two healthy children; himself of sound breed. Has worked hard and has never known a serious illness. No malaria. In October, 1886, consulted me. I found him a man weighing 180 pounds; height six feet, vigorous, with soft arteries; heart beating 76 and perfect. He has no piles, hernia, or varicose veins. Eats well; is in all ways moderate and regular; does not smoke and does not chew tobacco. All the reflexes are normal; the heart and arterial tension healthy. No organ is diseased; can work all day; no tenderness in nerve-tracts.

About four years ago he began to wake now and then with distress in the legs. During the next year this got worse, and now is a source of extreme suffering and of disability, because of the loss of sleep it causes. Within an hour after bedtime he awakens in what he calls tor-

ment. From the knee to the toe his legs ache, without throb or sharp pain. He rises, walks until weary, goes to bed, sleeps, and wakes to the same pain or distress. Again walks, and so on, until day brings relief.

At the Infirmary we learned that in the attacks the legs remain normal as to temperature, reflexes, and electrical conditions, as well as to sensation. No remedies were of the least use, except morphine, and I advised its steady use in despair as to other means.

Sensory Shocks. Another phenomenon of sleep, or its borders, and also in the sensory sphere, I described long ago as sensory shock or discharge.¹ This is a more rare, but also a more interesting disorder, than numbness. Except my own paper and a small book by a homœopathic practitioner,² I know of no literature on the subject beyond a few lines of remark on my paper in an essay of Hughlings Jackson's. Nevertheless, the subject is still of interest.

All the disturbing phenomena of sleep at some time represent themselves, more or less well, in our waking hours; but sensory shocks are, of all disorders of sleep, the most rare in daytime.

In the *præ-dormitium* while sensation is fading, but never on waking from sleep, the patient has in his head a sudden and violent sensation, and the forms it assumes may be classified thus:

1. *In the sphere of general sensation.* He feels as if struck, or as if he had a shock like that which a sudden arrest of motion causes; or it is a feeling of rending,

¹ Virginia Medical Journal, op. cit. Lectures on Nervous Diseases, op. cit.

² In Dr. W. S. Searle's book he described sleep-shocks as a neurosis, hitherto unmentioned in medicine, and was evidently unaware that I had already and fully delineated its peculiarities.

or as of a bolt driven through the head. These are the most common.

2. *Auditory.* A loud noise, like that of a pistolshot or of the crash of broken glass, or as of a bell, or a wire sharply twanged.

3. *Visual.* A flash of light.

4. *Olfactory.* Sudden sense of an odor.

5. I doubtfully add what I call *emotional discharges*. These are always mere abrupt sensations of fear, sometimes *preceding* the sensory shock, and sometimes *following*.

What happens is usually this: A man going to sleep, but still quite conscious, and able to observe, feels suddenly a shock in the head. It seems mechanical, as of a blow, or noise, or else of both; and, also, there may be added a flash of light, vivid or like the soft summer lightning along an evening horizon. The intensity of these phenomena may be appalling, and even those who are used to them greatly dread their return. The first experience is sometimes most alarming.

In many cases there is an aura. A physician, who came to me on account of these attacks, first called my attention to this. While waiting for sleep he became aware of an indescribable something which rose from the feet and hands, and, taking eight or ten seconds to reach the head, ended in a sound like the crash of glass houses breaking in a hail-storm, with a vivid flash of yellow light, leaving him for a moment dazed, but able at once to rise, or to think. Such is the usual account given of this aura. It never varies, save that it may rise only from the belly.

All sufferers, or nearly all, who have an aura, say they can stop the attack by turning over, or sitting up,

or even by opening the eyes. A friend, who had this trouble owing to tobacco, says :

CASE XXVIII.—“ The shocks were of two kinds ; one as if I received in the brain a thump, and one as if a pistol-shot occurred *in* the head. I had for a long while no idea that the pleasant mistress, Nicotia, was disturbing my internal economy. At last, before learning this, I got used to these abnormal things, and would lie still and feel what you call the aura. By the way, it is not at all like an air, but like the surging upward of something more positive. When it gets to the neck I am gone ; the explosion occurs. Below that I can avert the wretched thing, either by rising or rolling over, for it never comes except I be on my right side. No mental effort suffices to check it.”

I have notes of two males who suffer only if on the right side, but I have not always made inquiry as to this point.

The aura is said at times to be like a tingling, or else is described as an upward surge of indescribable nature, and at times rises only from the epigastrium. Often there is none. Once felt in any case, it usually continues in some form to precede all future attacks.

There is another form of warning, which patients only succeed in describing as a state of brain which foretells the shock. I have heard this called a humming, or buzzing, within the head.

Hysterical women are often quite unable to stop the shocks, or else the aura is too swift to be a timely warning. It is rare to find any grave result. A few people become vertiginous, but not severely. At first, alarm causes emotional scare and a quickened heart, and in some few, even when repetition has lessened the terror of the shocks, they cause a more prolonged palpitation

of the heart. In a few minutes, when sleep is again near, comes another shock, or there are a number of slight attacks, as of a bell, or a guitar-string twanged, and by degrees fading away; visual discharges less commonly recur in this manner.

I have over and over met with cases of sensory shock in the daytime, but only in the hysterical. In some few people they occur during sleep, and awaken the patient, but their habitual time is in the *præ-dormitium*.

All of these curious outbreaks represent, as a rule, the "coarse stuff" of sensory product, or something near it. There is sense of shock alone, or this in succession with noise or light, or both. The noise is more rarely comparable as to a note of music, or as to a bell, or a string vibrating. And so also of the optic explosion. There is light, violet or pale yellow. No visions appear; no voice calls. It is "primary sensory stuff," and no more. In the one case connected with smell the patient had an epigastric aura, and smelt bananas. She had anosmia.

These singular symptoms are found in some neurasthenics, in hysteria, and most often in men as a result of overuse of tobacco-smoking. I first knew of it in my own case, during an attack of neurasthenia, many years ago, and soon learned that it was immediately due to my *segar*. I can assure you that one's first acquaintance with it is most terrifying. Bromides and strychnine control it, as I have elsewhere stated.

I pointed out years ago the interesting resemblance of these innocent attacks to epilepsy, and Hughlings Jackson has also noted the fact. Bennett,¹ in a paper

¹ *Lancet*, April, 1889.

on the Sensory Auras of Epilepsy, describes cases in which the signal-aura consisted simply of crude sensation, such as tingling or pain, which he calls sensory epilepsy. These are sensory cortex centre explosions, with consciousness and without spasm.

Next to touch-aura in epilepsy comes most often optic aura—sense of light, or definite color with form. In the præ-dormitium explosions the visual phenomena are still more crude than in these; but in epilepsy auditory auras are rare, and gustatory and olfactory auras still more uncommon. The patient who has a special sensory aura feels as if struck a sharp blow, or perceives a noise in the head, or sees red fire, or a flash of light, and has no fit. Or else he has a subjective taste, or, like a physician I know, smells human ordure for half an hour, and may or may not fail to have the usual sequent spasms. These epilepsies are very like such præsomnic shocks as give us in their completest form a sense of tingling, which, rising, ends in a more abrupt sensory discharge, as of a sensation of shock, light, or sound, or these variously combined, as does also occur in epilepsy sometimes, as I have seen. Again, too, in the subjects of sleep-shocks are found those who have in the præsomnic state conditions of terror or daze, which are brief, and represent like phenomena in the intellectual or emotional sphere, such as are the dazed or dreaming states of some epileptics. And, curiously enough, this, too, may in our illustrative shocks be preceded by a sensory aura of one or two senses—double auras.

In epilepsy with auras we may have, first, an aura—*i.e.*, a sensory discharge, usually simple tingling—and then a sense of flash or sound, or of light and sound

together; the centres being, one may notice, in juxtaposition.¹

In *præsomnic* discharges the discharge is simple, or preceded by tingling—true aura—vague epigastric sensations. The analogy to epilepsy is closer when, as often occurs, an uncontrollable jerk or flop of the whole body ends the attack. With motor centres pathologically over-excited, or capable of being morbidly over-charged, widespread epileptic motor phenomena may follow the sensory discharges, and in early cases of sensory explosions hysterical convulsions of mild type may result, and thus bring us still more near to the sequential chain of epileptic conditions. On the other hand, epilepsy is not a disorder which haunts the *præsomnic* time. However close the apparent analogy, there must be a wide difference between it and these sensory explosions.

Lastly, there is a form, which I have seen but twice, in which we have an aura—a flash, shock, or sound—and a sense of pain darting down the cervical spine and then along both arms to the finger-ends.

Sleep-jerks. Chorea. In the motor sphere are certain disorders which trouble the sleep, or *præsomnic* state, in hysteria and neurasthenia, and which are only distinguished from phenomena found in health by their excesses. We all have had the common experience of a sudden jerk of the body as we were falling asleep. This, in certain cases, is exaggerated as to degree and number, and may occur also during sleep. I have seen many cases in which, scores of times in each night, the sleeper was awakened by a violent movement of every muscle at once. In others the jerks are of arms

¹ Angular gyrus and superior tempor o-sphenoidal convolution.

or legs only. Probably, what are known as "foot fidgets," which oblige the sufferer to move in order to get rid of an ever-recurring sense of unease, are, too, of like parentage, and are to be seen in all degrees of intensity. I was lately consulted by a Western banker, aged forty-six years, to appearance well. No organ was diseased. He had passed successfully through a time of great financial trouble, and in its midst his wife fell ill. After she recovered he began to be a poor sleeper, and exhibited in turn a variety of sleep-troubles. He had mild forms of shock—*i.e.*, light and noise. Dis-use of tobacco aided these and improved his sleep; but, somewhat later, he began to have jerking in sleep. An arm, or the leg, or the body was violently moved, so as to wake him up, and this, he declared, took place countless times in the night. Still later he lay awake with uneasiness in the legs. He moved about and got a little relief. If he lay still, he had to move again.

These motor discharges at times assume, through their frequency and severity, such importance as to affect health by the destruction of sleep which they occasion. An instance is given in my book of a woman weighing two hundred pounds, who spent her nights in a series of motor explosions so vigorous as at times to break the bed-slats. She has told me that she believes herself to have had as many as a hundred in a night; the whole body moving violently in sleep with a jerk like the leaps of a dying fish.

A different form of unease is seen in children who nevertheless seem to be well. Their sleep remains unbroken, but they roll over, twist, turn, wriggle, and continue to do so for hours. Possibly they are dreaming, but of this there is often no evidence, and they are

not affected in health by this extraordinary restlessness, which may remain as the habit of a year or more. I have over and over watched these little ones in a sleep which permitted them to roll over and bend the body and move the limbs, until it seemed scarcely possible that they could remain through it all in a state of slumber. A little pause might follow and then another period of nearly constant movement.

In adults such extremity of restlessness is very uncommon, and means more than in childhood. Of the hysterical sleepers much might be said, but in them this form of activity during sleep is seen at times.

In the singular ataxia of hysteria, which I described a few years ago, the early stages of the disorder are apt to exhibit on waking an ataxic condition, which becomes increasingly worse, and at last continues through the waking hours. More commonly the ataxia comes on by degrees, and only in the day.

Lastly, in relation to the motor sphere are the rare examples of chorea seen only for a time on waking from sleep, of which elsewhere I find no mention. As regards this, I may remark that some early ataxics and some neurasthenics are apt to be unsure of their movements for a little while after waking.

CASE XXIX.—A. B., female, aged fourteen years, menstruating regularly; somewhat anæmic, but in other respects healthy.

Last spring, in the month of March, she was attacked by a singular form of chorea. She had this trouble at no time except in sleep and on waking from sleep; on either occasion it occurred in attacks which did not last very long. Her mother, who frequently watched her in the night, said that three or four times in each night she became restless,

kicked off the covers, and began to move her hands, slowly flexing or extending them until at last, the arms also moving, a general choreal movement ensued, which, at the same time, affected the legs, arms, and body, but never the face. The attack affected her almost always when she awoke from sleep, during the time she was suffering from this disorder. In the warm summer weather it disappeared. It has returned again recently. She has been under my care for some time, so that I have had an opportunity of seeing that she is a person in perfect health, with no organic disease about her on which I can lay a finger. The attacks in the night are very rare, but she scarcely passes a morning without waking in this choreal condition. The spasm lasts from a half to three-quarters of an hour, and by degrees fades away. She apparently has no control over her movements, and in this respect they differ from ordinary choreas, except of the worst kind.

This special manifestation of chorea must be extremely rare. In the experience of many years (in which I have seen a multitude of cases) I recall but three or four of this character. It is mostly confined to sleep or to the awakening state, not apparently existing during the day. I have no hesitation, however, in classing it as chorea, because it readily yields to the treatment which is given to choreal cases, and because, in one instance, it occurred in a child who had had two previous attacks of chorea. This instance is, perhaps, worth relating:

CASE XXX.—C. J., a clever little boy of about twelve years—not very strong nor very active-minded; never rheumatic; heart normal; not very fond of outdoor sports, and somewhat anæmic—was attacked one spring with chorea, from which after two months he recovered. The following

spring he was attacked again; this attack lasted seven weeks, after which he again got well. The next spring it was replaced by the peculiar form of post-somnic chorea of which I have spoken. He had absolutely no chorea during the day. He usually woke up about half-past seven in the morning with choreoid movements of the hands; both sides were alike affected. They were not in character like those of the girl mentioned above, and were more distinctly under control. For half an hour, however, he could not pick up anything without dropping it. What struck me with him, also, was that the face was not concerned in any way, nor did it affect either leg. Sensation did not appear to be affected, and he was relieved by the ordinary arsenical treatment and cold douches.

Tonic Spasm is another rare trouble born of slumber, and lasting after it. I quote the only cases my note-books afford:

CASE XXXI.—Mr. J. C., aged forty-five years, merchant, had syphilis and distinct secondaries at the age of twenty-three years. Was well at the time of the malady about to be mentioned—that is, he had no perceptible organic trouble.

About four years ago he began in the early mornings to wake up with rigidity of the legs. This was so extreme that it was impossible for him to bend the ankles or knees, or to elevate the knees at all. If they were lifted by another with difficulty, they fell slowly in extension. It was truly, therefore, a distinct tonic spasm. If at that time he had excess or defects of knee-jerk, I cannot learn.

This state continued to show itself for over two years, occurring at intervals; sometimes taking place every morning for a week, then lapsing for a month, but never existing at other times than when he came out of sleep. If he woke up in the night, he occasionally had this same condi-

tion, but this was far more rare. It was commonly a morning affliction, and lasted for a few minutes or at most an hour.

After a certain length of time the symptoms disappeared, but, owing to a bout of drinking, they renewed themselves. Again he got well, and a period of two years elapsed without further trouble. He then began to have vertigo, followed by difficulty in controlling his water, and this was followed by incoördination and the entire range of ataxic troubles to which he is now a victim.

I quote another case as a still more remarkable example of rigidity developed in sleep and continuing for a time after waking:

CASE XXXII.—The patient was a man in good circumstances, aged forty-five years. He was in the habit occasionally of awakening in the middle of the night with rigidity of the legs. The limbs were violently extended, the feet being so completely flexed as to be straight with the line of the legs. It was almost impossible to lift the legs without lifting the whole trunk, so tightly were the muscles contracted and so rigid was the whole mass, including the intra-pelvic group. This did not seem to be due to anything in the way of specific disease nor to bad habits. The man had no disease to which I could relate it, except that he had been for many years a dweller in the lower part of the city, and had had attacks of ague year after year, and one very severe attack of remittent fever. Beyond this there was nothing, and these symptoms had long since disappeared; neither spleen nor liver was enlarged, nor, at the time of the rigidity, was he suffering from any malarial difficulties. The kidneys, heart, and lungs were alike sound, and to this day I remain puzzled as to the causation of this very peculiar malady. I saw

him several times, because he used frequently to ring me up in the night in order that I might witness this affection, which was painful from the intensity of the contraction of the muscles. I have heard him scream from what he described as "positive agony." Indeed, nothing relieved it except full hypodermatics of morphia, under which slowly, within a couple of hours, the muscles would relax, but always after an attack would remain extremely sore for days together. He finally ceased to suffer.

I have seen a disorder of the same kind, or something similar, in hysterical women; but even among them it is very rare, and it is not necessary for me to go into details. The state is merely an hysterical curiosity. I mention it to complete the list of peculiar cases which I select from my note-books.

Respiratory Failure in Sleep. I conclude this study of the disorders of sleep by calling attention to one of very great interest. I believe that it was first described by the late Professor Samuel Jackson, but I have been unable to find his paper, which is not in the catalogue of the Army Medical Library. I recall, however, hearing him speak of cases in his lectures.¹

Where, for some reason, the respiratory centres are diseased or disordered, a man may possess enough ganglionic energy to carry on breathing well, while the waking will can still supplement the automatic activity of the lower centres. But in sleep, these being not quite competent, and volition off guard, there ensues a gradual failure of respiration, and the man awakens

¹ Since this paper was first published others have called attention to this symptom in sclerosis.

with a sense of impending suffocation. This is not to be confounded with the hysterical sleep-symptom of sense of suffocation, which is probably closer to the phenomenon of nightmare, and is followed by or associated with fear, and is soon lost on awakening.

In the cases I refer to the symptom is sometimes a signal of dangerous meaning. I have met with it in extreme neurasthenia, but in worse forms in locomotor ataxia in its paralytic stage. I have never seen it in labio-glossal lingual paralysis, where it should seem likely to occur. In ataxia it may be due to sudden incompetence of the laryngeal muscles, which are liable, late in ataxia, to become paralyzed. Usually, however, it appears to be a failure of the chest and diaphragmatic movements.

CASE XXXIII.—Mr. C., aged fifty-six years, had posterior sclerosis, but gave no evidence in the day of respiratory incompetence, although he was distinctly far in the paralytic state. When in deep sleep he began to breathe less and less deeply, and at last, for a few seconds, not to breathe at all. At this moment he moved, twitched, and at last awakened with evidences of commencing apnœa in the color of the lips, tongue, and nails.

When awake a few voluntary efforts to respire relieved him. These attacks became at last so frequent and perilous that a nurse sat by his bed and awakened him as soon as he began to breathe less and less deeply.

As time went on the trouble increased, and whenever he fell asleep respiration ceased abruptly. He was finally worn out with loss of sleep, and died suddenly in one of these onsets of respiratory failure. No post-mortem could be obtained.

I have seen two other cases, but none so remarkable as that I have briefly related. But on the morning

after I wrote these lines I saw a case in an ataxic not yet in the paralytic stage. Just at the moment of falling asleep he feels a sense of suffocation, fails to respire, and, in great alarm, sits up. These attacks probably differ somewhat from those of sleep.

The type differs from that of the ordinary Cheyne-Stokes respiration, being merely a gradual failure to inhale—a less and less deep inspiration, but no sequence of rapid breaths ending in dyspnoea.

CHAPTER V.

CHOREOID MOVEMENTS IN AN ADULT MALE, PROBABLY OF HYSTERICAL ORIGIN; UNUSUAL HYSTERICAL MOVEMENTS IN A CHILD; HYSTERICAL MYOCLONUS.

CASE XXXIV.—D. F., a white male, aged thirty-seven years, applied for treatment December, 1894, on account of spasmodic to-and-fro movements of the head. The family history is negative, and the previous health has been generally good. He had typhoid fever when ten years old, and again when eighteen. He has been married fourteen years, and has had three children, of whom one died of dysentery. Syphilis is denied, and there is no evidence of it. His habits were good, and he did not use tobacco excessively.

About three months before coming to the Infirmary he had been much worried about moving his place of business to some other part of the country. He could reach no decision, grew nervous, slept little, became dyspeptic and very melancholy. After about two weeks spasmodic movements of the head suddenly appeared.

Present state. Every few moments the head is forcibly jerked backward by the trapezii muscles. When lying in bed the spasm is much less frequent. It is increased in frequency during examination, and for a time ceases entirely if the attention be strongly directed to any object. For example, while looking at a thermometer bulb the patient was quiet for five minutes. During sleep there are no movements whatever. While in the hospital he developed general choreiform movements.

He is fairly well nourished. His expression is markedly melancholic. Intelligence is good, but he is profoundly apathetic. He declares that he sleeps very little. His appetite is poor and he suffers much from gaseous eructations after eating. The thoracic and abdominal organs are normal, the station good, and the gait normal. The urine is normal. Prof. de Schweinitz examined his eyes, and reported slight hypermetropic astigmatism with insufficiency of the interni.

The patient was put at absolute rest in bed, given gelsemium, bromide, and chloral, and, later, hypodermatic injections of distilled water. These had a very happy effect upon his insomnia, and, indeed, caused he declared drowsiness the following day. After about eight weeks' stay in the hospital he was discharged greatly improved, but still having occasional clonic spasms of the trapezii. There were no sensory changes. The man was emotional and given to tears. Soon after admission he began to have at times, after exercise, great emotion, or any excitement, curious movements of one limb or of the trunk. Thus the arm would be extended forcibly, and again and again for a half-hour, or the leg, or both legs, with intervals of twelve to fourteen seconds; or the whole trunk, as he lay, flopped fish-like until wearied. The head-movements were likely to cease when any other form of spasm was present, but were, on the whole, the most common. They were generally either to-and-fro motions or backward jerks, seemingly due more to the trapezii than to the other posterior neck-muscles. Over all of these movements he had temporary volitional control. When he thus restrained them he said that the sense of discomfort became by degrees really unendurable, and he had to "let go."

REMARKS. The resemblance, clinically, to the cases of habit-chorea or habit-spasm, as Gowers likes to

describe the disorder I first called attention to some years ago, is very striking. The lad I shall show you to-day is another illustration of a genus of cases which has several related species, and such variety as individuality may occasion. As in this case, so also in that of the boy, hysteria is the potent agent in their production.

CASE XXXV.—B. F., a male, aged ten years, applied for treatment in December, 1892, complaining of involuntary movements of the head. His father had had fits in childhood, and one cousin has had habit-chorea. One brother died in convulsions when seven months old. The patient had diphtheria when two years old, scarlet fever three years ago, and measles last year. He has always been nervous. The mother states that he is the smallest boy in his class and has always stood at the head in his studies. She thinks that overstudy in preparing for examinations may have been the cause of his illness. The present trouble began about two weeks before application for treatment.

There is constant wagging of the head from side to side, shrugging of the shoulders, and winking. The patient is a bright, well-made lad, with excellent muscular development. The station is good with the eyes closed. The knee-jerks are capricious. Clonus is absent. The cremasteric reflex is present. The abdominal reflexes are absent. The elbow-jerk is present. The muscle-jerks in the arms are very marked. There are no palsies. Speech and sensation are normal. His physical health is good, and examination reveals no disease of the abdominal or thoracic organs. The foreskin is very long, but there are no adhesions. There is no genital irritation nor any bad habit.

Prof. de Schweinitz examined his eyes and reports: "R. E, V. = 15/xxx. Round disc, temporal edges clear;

nasal and upper and lower margins hidden by grayish infiltration; much white tissue around central vessels. Veins full, arteries normal. L. E., V. = 15/xv (partly). Similar condition of disc, but blurring of disc less marked. Slight concomitant convergent squint. Eyes wander in under cover. Hypermetropia = 1.5 D. Slight astigmatism. Diagnosis: hemi-neuritis with hypermetropic astigmatism, and slight convergent squint."

The case was diagnosticated as habit-chorea, treatment given, and the boy told to return in a week. Two weeks later he came back showing marked changes in the symptoms. Every few minutes the head is jerked violently and suddenly to the right or left. Previously the motions had been slow and gentle. An arm is very forcibly extended once, or the legs are flexed and extended once. Similar movements elevate or depress the shoulders. These movements are independent of each other; that is to say, at any given moment any part may be involved, though oftentimes the legs move synchronously. The movements are shock-like, sudden, rapid, and violent. They appear almost as if willed. During sleep they cease entirely. Emotional excitement increases them markedly. Voluntary motion of arm or leg decreases them for the time being in the member used, but has no effect upon the rest of the body. While lying down they are less severe than when up. There are no sensory failures. He was given Fowler's solution in increasing doses and ordered to be kept at rest.

After a few days the movements suddenly ceased, but were immediately followed by attacks of violent, barking, spasmodic cough, so severe as to alarm his parents. When next seen at the Infirmary he would every few minutes make a short, quick, explosive, grunting noise. When told to breathe deeply the cough stopped entirely. Attention produced by having him fix his eyes upon a bright

object had the same effect. Slight general choreiform movements were also present. Complete cure followed his admission to the Infirmary and subjection to the hospital discipline in bed for a few weeks.

REMARKS. This case, as you see, looks like what I venture to call *acute habit-chorea*. The same power of control exists for a time as in the man. The uneasiness under self-control is present. The abrupt cessation of other movements when the barking or grunting comes on is sometimes seen in habit-chorea; but in that disorder there are usually frequent repetitions, never violent, of the part disturbed. This lasts for days or longer, and on ceasing may be replaced by like movements elsewhere. These children may or may not be hysterical, but the hysteria of childhood often fails to give you a complete picture of that disorder. The grunting is not like the cough of hysterical women, and is probably only an incidental product of one of the forms of semi-spasmodic movement. At times it is due to sudden abdominal muscular contractions. Clinically and practically all this is interesting. Of this you may be sure, that when adults are afflicted with these forms of temporarily controllable semi-spasmodic motions, you will find them hard to get well. All the emotionalness of such temperaments as incline to motor disorder is increased by their presence. These people get self-watchful, depressed, and will-less. Children are easier to cure, no matter how grave the malady, or how distinct the hysteria. Always with them developmental change assists, if you know how to use your opportunities. Isolate them, if possible. Insist on mild diet—as of milk or vegetables, or these combined. Keep them at rest, and by-and-by offer little bribes to restrain the

movements. The slight cases of habit-spasm may be enduring, and the more severe cases get well, like this good little fellow. There are cases which do not, and which develop into the disastrous states of mind and body I have delineated in my Lectures on Nervous Diseases. These failures are commonly due to the folly of parents. There is no worse enemy of a nervous child than a nervous mother. The peculiar violence of spontaneous action in the lad's spasmodic movements recalled to my mind a man who, many years ago, was my patient. He was subject—and for periods of a week or two—to a disorder of which, being a quiet bank-clerk, he was much ashamed. After a few days of general uneasiness, which made him restless and inclined to excessive exertion, he began to have spasmodic actions—like this boy's—a sense of profound unease for a few minutes, ending in a single motion of abrupt violence. A leg was thrown upward or back; an arm, with the fist clenched, struck out once with a look of purpose about the act which was contradicted by the fact that he had over and over hurt his hand by driving it against some obstacle. Once or twice he had hurt others. At times he would warn me or another of the coming risk. No cause for this peculiar state was ever found; nor do I know what became of the man.

Some of you may recall the interesting case seen here last year, in a Hebrew in middle life, who presented a striking illustration of multiple myoclonus. I reported it with other as curious spastic cases to the Neurological Association. I now recall it to state that the man has become well and walks about like others. I saw once, some years ago, a similar case, and it too was hysterical and in a Hebrew.

And now I am able to read you the notes of a case of multiple myoclonus, clearly hysterical, and in a gentleman whom I lately saw in consultation in a distant State. As I have so lately discussed the possibility of these spasms originating in the cord, I shall not need to repeat my remarks.

CASE XXXVI.—C. B., aged thirty-five years.

Family history. Some of the remote ancestors were rather eccentric or peculiar in certain directions. His paternal uncle died, aged forty-five years, of acute cerebral disease, said to have been encephalitis. One cousin, a son of this uncle, has had incoördination of all the extremities, choreic movements of the face accompanying voluntary movements only, and indistinctness of speech, which were first noted in infancy, but were not thought to have been congenital.

The mother's labor was normal, no instruments having been used. The child was somewhat backward in development; the anterior fontanelle seems to have remained open unusually long. There were decided indistinctness and difficulty in speech, which only disappeared after some years. At school the boy was rather slow and seemed disinclined to learn. He was always a little peculiar; he had very strong opinions on various subjects which could not be readily influenced, and were different from those natural to his companions. For some years before his present attack (six years ago) he had been considered rather odd by neighbors. When about seven years old he was thrown out of a light wagon and the wheel passed over his head. No evidence of fracture of the skull was detected and he seemed well in a few days. When fifteen or sixteen years old, and while studying rather hard at school, he began to have severe frontal, bilateral head-

aches, which at first came after study only, but gradually persisted, although the study was given up, and after a time came in the mornings without apparent cause, lasting some hours, apparently often connected with the condition of the weather, being worse when there was a cold, piercing, or bracing wind. From this time the headaches have persisted, at first coming principally in the spring, while he was free from them during the rest of the year; later, occurring at any season, and gradually growing more frequent and more troublesome, so that, finally, he gave up his home in the city and lived entirely in the country. Study was found to be impossible. Change of climate made his sufferings worse. The patient led an out-of-door life, superintending and working on his farm until his present trouble began. He was an unusually large, strong, and muscularly well-developed man.

The present trouble began six years ago, some time after a moral shock in which the emotions were much involved. He was attacked with unusually severe headaches, general lassitude, and inability to work, so that he let his farm for a time and came to live with his parents, who had a large estate in the neighborhood. While with them he was one day, when driving, attacked, without apparent cause, with a fit of coughing, which lasted some minutes and was of a convulsive character and so violent as to be alarming. After this similar attacks of coughing came on almost daily, and seemed to be aggravated or provoked by driving. A few days later he began to have attacks of violent, involuntary movements (clonic spasms) affecting the extremities, being at first often unilateral, sometimes on one side and sometimes on the other. The lower extremities were more affected, on the whole, than the upper. The earlier attacks of spasms occurred only on rising in the morning. After a few weeks the coughing-spells were largely replaced by hiccoughs, and it was found that the

headaches, the cough, the hiccoughs, and the motor spasms were more or less interchangeable. Since this time the general features of the affection have remained unaltered. The motor spasms have gradually become more frequent, for some years occurring daily at stated hours (periodic), with frequent intervening attacks, and now several times every day. The motor attacks consist of very violent, more or less regular movements of the extremities, especially the lower, when violent stamping or up-and-down movements follow each other with great rapidity; in the upper extremities there are regular, coarse movements of the entire extremities. These attacks come on, especially at the regular times, without apparent cause, but are also produced at any time by a sudden, unexpected touch or by any touch with which emotion is connected. They are also produced by movement (both sensori-motor and moto-motor spasms).

The paroxysms of cough disappeared after some months to a considerable extent, while the hiccoughs lasted only a few weeks, the place of both being apparently taken by the larger spasms of the limbs. During the last three years there have been many attacks of retching and vomiting (or regurgitation), without nausea, and, for the last two years, attacks of violent and forcible shouting.

For a year past some loss of strength has been noticed and an increase in the ease with which the spasms are caused, especially by walking, so that they now largely preclude any attempt at exercise, as he states that he is liable to have his legs drawn from under him violently and suddenly, so that he falls to the ground. If walking he persisted in, in spite of the spasms, the headache becomes unbearable. Of late, the trunk has also been invaded by the spasms, the body being frequently bent to one side, usually the left; and clonic spasms in the trunk-muscles sometimes last for hours and even days (once

apparently without remission for four days, but the patient was not seen while asleep), causing great soreness and tenderness in these muscles. There is now much dizziness, which began first six months ago, and now causes an additional difficulty in walking.

He has taken food irregularly for years; of late, not more than one meal of solids a day, and that usually at 11 P.M., and the rest of the time weak coffee or milk when wished for. The bowels are regular; the urine negative. The face is now usually pale, but becomes turgid and congested during attacks, partly from the violence of the motion. The intellect is unimpaired (broadly speaking). Sleep has been good.

REMARKS. This gentleman, unlike our former case, is in easy circumstances. It were better he were not, as he is able to control his own surroundings and to isolate himself as he pleases. The limitations to which the position, age, and circumstances of the case subject our therapeutics must be clear to you. When I first examined this most expressively hysterical case I found my patient up, and after a partial examination, with increasing signs of fear and nervousness, he went to bed. There I completed a long, but, of necessity, imperfect study. He was a rather well-built, well-colored man, with no organic troubles. As I went on to make the ordinary search as to sensation, reflexes, etc., all being normal, he became all the time more and more convulsed. If I touched a leg, it passed at once into violent convulsion, and this at times involved all four limbs, and was so terrible that I thought the bed would be broken. When he tried to walk, and always then if emotionally disturbed, he would begin to stamp in a strange way and with swiftly increasing force, and this

spastic state, reaching the trunk, seemed then to draw him down, so that he fell or contrived to get back to the bed. I was obliged at last to cut short my examination, but not before, with the aid of his physician, I was able to reach very distinct conclusions.

Cases of violent hysteria in the male are not common, at least in America. Only once in my life have I seen a male exhibit all the acts in the long drama of hysteria precisely as we so often see them in the female. I now add the opinion given in the case of Mr. C. B. A careful consideration of the symptoms brings me to three conclusions:

1. That the form of the convulsive attacks brings this disorder closer to the clinical delineations of myoclonus than to those of any other group of symptoms. He is liable to have violent stamping, or worse, from standing—*i. e.*, sole-pressure causes it. Also, when cognizant of it, a mere touch anywhere brings on clonic spasms of the legs, or of the arms under like circumstances. Voluntary motion may, as in other cases, give rise to like spasms—*i. e.*, the spasms as to cause may be sensori-motor or moto-motor.

2. Evidently attention increases the severity of sensori-motor manifestations.

3. For various reasons, this myoclonus seems to me hysterical. The transfers, the interchangeableness of spasms, headache, regurgitation, hiccough, and vocal symptoms, all point this way. So do the type of laryngeal phenomena and the characteristic regurgitation without nausea; and that the first spasms followed a grave emotional disturbance assists us to a like conclusion. The original injury may have been contributive,

but there is not in the skull any distinct local evidence of organic lesion.

If it all be at last hysteria, or due to the injury but in its outcome hysteric, one might look to find sensory changes; but close examination of the skin is impossible, and without ether I could not see the eye-grounds as I wished to do. It would be worth while once to do this under ether. Probably the spasms have their birth in the cord. They seem to me in quality and history functional, and I ought to add that, when off guard—a rare thing—the touch of my hand does not occasion spasm, nor does his own touch of himself, unless, having been asked if it be so capable, he with pre-attention touches himself.

Probably he is incurable, but this does not imply the certainty of his not losing the spasm. If he were a lad, I should take him away, and with isolation, massage, and electricity treat him, and have hope. Now, I do not advise it. I should like to see hypnotism used. I would assuredly use arsenic for a year. I would not let him live wholly alone or unvisited by friends, as he now wishes.

Hypodermatic use of arsenic is to be considered.

I have little doubt that the injury may have been the ultimate cause of headache, and that he has had more or less of chronic meningitis. If he could have a good study of the eyes by an expert, I should feel better satisfied, as the eyes may, with slight ocular defects, be competent to trouble a defective brain. Also, the color-fields might prove very interesting.

I gather enough in various ways to make me think that Mr. C. B. was never a perfectly normal person in earlier youth. When, to a person of such neurotic

type, come accident, emotions, etc., then the worst and the more unusual results are to be apprehended.

Yet a word before I close the lesson of the day. I have used the label hysteria again and again. It is, and as yet must be, a word of somewhat loose employment. I am not sure that it is just to apply it here, because with spastic or other symptoms the patient is merely emotional; but certainly we, by common consent, do this, especially in the unusual forms of spasm and in cases in which clearly emotion was the parent of spasms. When we have areas of anæsthesia we use the term in question with lessened doubt. If, too, we find these, and with them optical anæsthesia for colors or especially reversals of the color-fields, our doubts are further lessened. But, after all, it is the grouped conditions which fully justify such clinical labels. Dr. J. K. Mitchell and Prof. de Schweinitz have shown how much our American experience as to the eye-symptoms of hysteria may vary from that of the French observers.

CHAPTER VI.

SUBJECTIVE FALSE SENSATIONS OF COLD.¹

I DESIRE to draw attention to a single symptom which has not, hitherto, received sufficient notice; it is not of extreme rarity.

The cases I shall report are characterized by the facts that the patient complains of local or general coldness, and that, as a rule, the parts involved have no abnormal temperature, or have one the reverse of that complained of. No doubt there are in medical literature many such records, but they must be buried in cases which, being reported under other titles, are difficult to find. In the catalogue of the Army Medical Library there is no heading which covers this symptom. The meagre material which I possess could, with time, have been made larger, as I find that almost every physician has met with cases of the kind I am about to recount. I have enough, however, to enable me to make a rough division of my cases into at least three classes:

Class I. has a central cause, and must be of great rarity.

Class II. is frequently due to neuritis, and is not very uncommon. It contains cases which lack the remaining qualities of neuritis, and may or may not be due to local inflammatory nerve-states.

Class III. is inexplicable or hysterical, and the phenomena are commonly unilateral, as in the first class.

¹ Transactions of the Association of American Physicians and Pathologists, 1895.

As these cases have not occurred to me in such competent numbers as to enable me to generalize largely, I shall relate them with what comment each suggests.

CLASS I. In this class I have but a single case, but it is so remarkable that I am glad to present it for consideration.

CASE XXXVII.—Sir P. Broke was seriously wounded in the head in the fight between the “Chesapeake” and the “Shannon,” in 1813. He received a severe sabre-wound on the head while boarding the “Chesapeake.” Of the later consequences of this wound I find no very distinct account in the loosely written and tedious biography of the patient.

On August 8, 1820, Sir P. Broke had a fall from his horse, which he described as follows:

“I was stunned by the fall, but it was only for a moment, for I was certainly dragged only a few yards; and I chiefly remember, as my first perception after the fall, that I was lying on my back and looking upward at my foot in the stirrup. I certainly got up unconscious of injury and walked about a quarter of a mile to my mother’s house, whence I had just departed. I remember nothing of this walk, and my recollection recommences with my sitting down quietly in the room and telling her I had had a fall. I began in a few minutes to have some sense of stupor, as from a blow on my head, and, having gone upstairs to wash the dirt off my head, I then discovered that my head was scratched in several places and bleeding. The stupor became more oppressive, and I sent for a surgeon, who bled me in the left arm, taking away ten or twelve ounces of blood. This might be about an hour and a half after the accident. The stupor increased considerably; I was persuaded to go upstairs again and go to bed. This I clearly remember, and that while pulling my clothes off a violent retching and vomiting came

on, and then my memory again failed me for several hours ; but on the following morning I was perfectly clear again and had some good sleep. I felt the usual soreness in the head from such contusions, but had no hurt in any part of the body nor any uneasiness in my stomach, and my appetite was unimpaired. I felt weak, but unconscious of any material injury beyond the bruises I had received.

“The usual treatment in such cases was resorted to to prevent inflammation, and successfully, though my bodily powers were thereby, of course, considerably weakened. The first symptoms that I remember of any affection of the nerves were my perceiving, in the afternoon of the day following the accident, a sense of extreme cold in my leg and foot and left hand, so that I could not sleep in comfort without a worsted glove and worsted stocking ; and in the course of the next day I discovered that the whole of the left side was strangely affected, the sense of cold appearing to lie internally upon the coating of the bones of the arm, thigh, and leg ; and that, though the flesh externally was warm to the touch and generally in a state of perspiration, and though the skin appeared perfectly fresh and smooth, without any sign of withering or contraction, yet that skin over the whole left side of my person was affected with a singular numbness to the touch.

“After a time it became necessary to consult Sir Astley Cooper, who wrote to Dr. Lynn in the following language :

“ ‘ I have heard from Sir P. Broke a minute detail of his feelings and an accurate history of his case. The situation appears to be as follows : On the left side of the head the sabre-cut has depressed the bone and compressed the brain ; and as the edges of the fracture, which are displaced, have long since united to the skull, all expectation of any change in that part must be abandoned, and the diminished nervous energy of the right side, consequent upon this injury, will continue without variation.

“ ‘Not so in the right side. There the mischief has been an extravasation of blood upon the brain or its membranes, and from decussation of nerves from the brain to the body the left side is suffering from diminished temperature or power of resisting its changes, and from altered sensations. The heart is subject to occasional alteration in its functions from diminished nervous excitability, and hence the pain felt in its region and the sense of strangulation under which Sir P. Broke occasionally labors. The stomach is also occasionally suffering from its sympathy with the brain, and hence those attacks which drinking warm water alleviates. Congestion in the brain from changes in position and from over-exertion of mind tends to a sudden increase of all the symptoms; but this is temporary only. The probability is that the blood will gradually absorb if Sir Philip’s general health be supported and he avoids too much mental excitement and he preserves his body from humid circulation.’ ”

Nothing is said further either by Sir A. Cooper or the biographer of Sir Philip in regard to the very interesting symptoms described; but in Guthrie’s *Military Surgery*, where first I lit on the case, that author thus describes it :

“Admiral Sir P. Broke received a cut with a sword on boarding the ‘Chesapeake,’ on the left side of the back of the head, which went through his skull, rendering the brain visible; the wound healed in six months. After temporary paralysis of the right side he recovered, with a loss of power and a disordered sensation in the second, third, and little fingers of the right hand, aggravated by cold weather and by mental anxiety.

“Seven years afterward he fell from his horse and suffered from concussion of the brain, which added to his former sensations by rendering the left half of his whole person incapable of resisting cold or of evolving heat. In a still atmosphere abroad, at 68° F., he said, ‘ the left side

requires four coatings of stout flannel, which are augmented as the thermometer descends every two degrees and a half, to prevent a painful sense of cold ; so that when it stands at freezing-point the quantity of clothing of the affected side becomes extremely burdensome. When exposed to a breeze, or in moving against the air, one or even two oil-skin coverings are necessary, in addition, to prevent a sensation of piercing cold driving through the whole frame.' Moderate horse exercise and generous diet improved the general health ; the warm bath caused a distressing effect ; the shower-bath, cold or tepid, increased the paralytic affection. Frictions with remedies of all kinds increased it also, and so did sponging with vinegar and water, as well as any violent, stimulating, quick excitement or earnest attention to any particular subject. The Admiral died unrelieved, twenty-six years after the receipt of the injury, of disease of the bladder."

Owing to the rather vague statements of the surgeons and the biographer, we can only infer that the fall may have given rise to a rupture of a vessel, supra- or sub-meningeal hemorrhage, slight motor loss, and irritative disturbance of sensory regions, causing numbness of the opposite side and false sense of cold.

Occasionally, in hemiplegia, coldness is a symptom mentioned by the patient, but not much complained of. I recall no case like this one, but I have distinct remembrances of at least two instances of probable clots involving the internal capsule and optic thalamus, causing lack of muscular sense and numbness on the left side. In both unilateral sense of cold was felt, although there was no fall of temperature. In one of them the anæsthesia was notable, so that pin-pricks were not felt and did not bleed. Both were adult males.

In cases of hemiplegia it is desirable to know not

only the actual temperatures of the two sides, but also how well cold and heat are distinguished on both sides; and, lastly, if there be abnormal subjective sensation of either cold or heat on the palsied side; and, too, the date of this symptom relatively to the attack—because, clearly enough, even in a cerebral paralysis, the later coming on of false feelings of cold or heat in the extremities may be due to peripheral neuritis.

CLASS II. *Local sensations of cold without lowered local temperatures.*

The three cases which follow are none of them as full as is now desirable, because the notes were made as mere memoranda for use in the conduct of the cases, and before I began to feel a larger interest in the symptom. All three were affected in the lower half of the body—two of them especially in the buttock, which is a not rare seat of the symptom in question.

CASE XXXVIII. (Case 281 in Note-book.) *Local sensation of cold in the buttocks.*—J. P., single; aged fifty-three years; Connecticut. The patient was a man of fortune, and had gone through a variety of excesses, chiefly sexual. He had had gonorrhœa, but never syphilis. There had been attacks of pain in the legs, arms, and back, and these had been in a measure relieved by various means before he came under my care. He also had a variety of vague gastric symptoms, which grew out of the hypochondriacal state. He had had tingling of both legs and feet, some loss of power in the right arm, tenderness upon pressure along many nerve-tracks, and a difficulty of using his brain for prolonged mental exertion, which I believe to have been of small moment.

The one symptom on account of which I have mentioned this case was the constant complaint of coldness.

When seen by me he was ruddy, in good flesh, and had no organic disease of any of the viscera.

The nerve-tracks above the waist were not sensitive, and he had long been free from neuritic symptoms of the arms. The two sciatic nerves were slightly tender from the exit-points to the knee. The electrical tests gave normal results. The station-sway was antero-dextral, and good; knee-jerk, right seven inches, left one inch, but sensory reinforcements added to the knee-jerk three inches or more right and left. Motor reinforcements added about two inches right and left. Superficial reflexes were normal. Sexual power somewhat lessened. Excessive exercise increased the tenderness and also exaggerated the sense of coldness. This symptom began to be felt before he complained of distinct pain in any region, and his aches were so much better that it was merely the coldness which brought him to me. This was positive and most distressing. It affected both buttocks and the upper half of the back of both thighs, and was as intense as if he were seated on ice. Occasionally the calves suffered.

I saw him but once, and I do not know how the case resulted. The parts complained of were warm to the touch, but I took no note of the actual local temperatures.

CASE XXXIX. (Case 840 in Note-book.) *Subjective sensation of cold in buttocks with actual elevation of temperature.*—J. P. C., coal dealer; aged fifty-two years. No syphilis or gonorrhœa; much on his feet; uses neither tobacco nor alcohol. Married, has two children. Family healthy and long-lived. The patient lives in a somewhat malarious portion of New Jersey, but has not, himself, been subjected to positive ague.

About eighteen months ago, having been more than usually afoot and somewhat worried by business annoyances, he began to have a painful sensation of cold in the left gluteal region, and down the back of the thigh

nearly to the knee. There was nothing of the kind in the other leg. This trouble increased gradually until it became so positive that he was in constant discomfort. It has varied very little up to the present time, and, although better in summer, is yet distinctly felt through the warmest weather. Heat at all times makes him feel comfortable, and the greatest amount of relief is obtained by standing with his back to a hot fire. As soon as he leaves the fire, however, the sensation of cold returns with all its vigor, and, in fact, rarely leaves him. There is no perceptible pain in the parts affected. His station is good; his knee-jerk is normal, three and one-half inches, and capable of ready reinforcement, both sensory and motor. The ankle-jerk is present and reinforcible; there is no clonus. Superficial reflexes exist in integrity. Electrical reaction of the limbs normal; water and bowel mechanism perfect; but he thinks that since this trouble began his sexual power has lessened. Digestion is good, appetite fair. All secretions normal. His eyes are exceptionally good, since he is not yet obliged to wear glasses. An actual examination of the temperature shows the left buttock to be distinctly warmer than the right; it was found to be $\frac{1}{4}^{\circ}$ to $\frac{1}{2}^{\circ}$ F. higher than on the right side. The exit-point of the left sciatic was at times tender. He declares himself to be not as strong as he was. He is somewhat paler, and has lost from four to five pounds of flesh. Always in the morning, on rising, he is nervous—as he says, a “little trembly.” There seemed to be no indications, except to look after the manifest failure of his general health. Quinine and arsenic had already failed, and long holidays in the mountains proved valueless. Iron was given in moderate doses, as well as strychnine and cod-liver oil. Within a week or two he began to gain in health. His weight improved, but there was no relief from the sensation of cold. Accordingly, I advised local massage; but after its use the parts

seemed colder than ever—that is to say, when the actual temperature of the parts went up $\frac{1}{2}^{\circ}$ to 1° F. under massage the sensation to the patient was as if the part had become colder. He was under the impression that galvanic electricity locally was of service, but exercise did not improve his condition. After many months' treatment, during which I saw him occasionally, he had gained largely in general health and freedom from nervousness, and in capacity to do his work with his usual energy; yet, notwithstanding, there was the same constant sensation of local cold.

I think malaria may be ruled out as a cause of his trouble. The most careful study showed no local tenderness, except as stated. There was at times, after long exertion, slight tingling of the left foot.

This case was one of real suffering; the ache of the cold was intense and disqualifying. In the light of other cases I suspect this to have been a neuritic condition. The increase of warmth from massage was felt as cold, and this is interesting, since he had a quite normal appreciation of applied cold and heat.

CASE XL. (Case 821 in Note-book.) *Subjective sensation of cold.*—Mr. C. S., aged sixty-three years; glass manufacturer. Patient has no bad habits; has never had syphilis. He has been for many years an extremely active business man, weighted with many responsibilities and constantly afoot. There are no head-symptoms. He sleeps well, has a good appetite, and there are no gastrointestinal troubles.

Five years ago he had some difficulty in passing water, and, later on, a return of the same trouble, which appeared on examination to be due to an enlargement of the prostatic gland. Within a few months he found that exercise tired him, especially mounting stairs. There is now no

cardiac lesion to account for the difficulty, and the arteries are in unusually good order. There is a distinct lack of power in both legs, and, in walking, he does not use the left foot as well as he should. His station is good; his sway, standing with his eyes shut, is antero-dextral, not exceeding an inch in either direction. The knee-jerk is normal, three and one-half inches; reinforcements are normal. There is no clonus, and no perceptible loss of sensation in the legs and arms, either as to touch, pain, or temperature. There is no tingling or numbness. The mixed urine of the night and morning contains two grains of sugar to the ounce, but no albumin or casts. None of these symptoms were such as to alarm him or cause him to consult me. He attributed them all to overwork and to being too much afoot.

That which drove him to seek my advice was a slowly increasing and very positive sensation of cold, from the waist down to the calves of the legs, and limited to the posterior half of the body. It was usually most severe on the right side, but varies a great deal, sometimes being felt more on the left. The sensation is described as being equivalent to that which would be experienced by sitting long on ice. It caused him to desire to cover the parts concerned with an excessive amount of clothing. As the cold was apparently lessened by motion, he kept afoot, when evidently his general condition demanded that he should not. He tells me that at times, after active motion, he has some sense of numbness down the back of the right leg in the region affected with the false sense of cold. I could find no notable difference between the temperature of the two sides of the body in the regions where he suffered, but, as both had more or less of the same trouble, it was natural that the temperature should not differ greatly. Normal surface-temperatures are apt to vary in different individuals, and to a far greater extent than interior tem-

peratures. There is no standard so exact as to enable persons to compare with it surface-temperature of a case like this; undoubtedly, however, the temperature was not below normal. The masseur who rubbed him insisted that at times the buttocks were warmer than they usually are.

My patient improved rapidly under tonic treatment and proper diet—in fact, the sugar disappeared entirely—and he regained full health after a few months of care. The unpleasant sensation of cold was the last symptom to leave him. It is as well to say, in conclusion, that my patient was not a nervous man, nor was he hypochondriacal. He was rather disposed to underrate than to overrate his symptoms. The complaint he made of the sense of cold was most positive; at times the sensation was so distinct that he could hardly keep himself from believing that some cold application was being applied to the parts in question.

In this case there was no sensitiveness of the lower nerves, but a sharp blow on the sacrum with a rubber hammer was felt in a dull, deep pain, somewhat lasting, and it seems possible that in this, as in the other cases of buttock-cold, there may be obscure commencements of neuritic trouble in the cauda equina. The sensation of coldness of the buttocks is not excessively rare. I have seen it from time to time, and now that my attention has been directed to a possible cause, I shall, perhaps, be better able in future to relate the symptom to its probable parentage neuritis.

CASE XLI. (Case 935 in Private Note-book.) *Subjective sensation of cold in the right foot, with actual increase of temperature in the parts.*—J. C., male, aged fifty-two years, a native of Pennsylvania, by occupation a clerk. Has had perfect health. Never had syphilis. Stands on his feet at work for seven hours a day. Is married; has six

children, all well. He lives in a country which is not malarious, a mountainous region 1000 feet above the sea.

About five years ago Mr. C. found that his right foot became painfully cold after standing for a length of time. Even when in a warm room he was inclined to dress that leg warmly—often wore two pairs of socks and an “arctic” rubber shoe, heavily lined. At this early period he found that the parts affected were not cold to the touch, and were apt to be more flushed than the other foot.

As the summer progressed (and this has been the case nearly every summer since) the foot became better. At times all that summer it was tender, and was eased by his sitting down. In the winter which followed the impression that the foot was cold was often so intense that he would go from his work and remove the covering from the limb and ask some one to examine the foot to see if it were not frozen. The observer called upon was apt to say that it felt warm to the touch. His general health remained good. He was able to do his work, and lived a tranquil life until a few weeks ago, when symptoms occurred which caused him to consult me.

I found him a man of fairly robust appearance, of good color, with no history of specific or malarial poison. His heart and kidneys were healthy, and there were no peculiarities which I need mention except those concerned with the foot. About six weeks before he came to me—that is to say, the end of January, 1887—the foot became more and more troublesome, and he began to have also a tingling sensation on the right side of the head in the scalp, and also in the hand on the same side. These symptoms came on suddenly one day, when he was rising in the morning. They have now passed away. The other head-symptom of which he complains (and which he insists he did not have before the symptoms just mentioned) is a

sensation of roaring in the head, accompanied with a throbbing in the vertex. The dynamometer showed good results for both hands. His foot and its conditions are what give him most trouble, and it is for these that he consults me.

Of the present state of his symptoms he gives me the following account: He is better in summer than in winter, although at all seasons the foot becomes distressingly cold when he has been standing on it for more than half an hour. To sit eases it somewhat; to put it up on a chair eases it more; lying in bed for some time gives him the greatest relief, as when he wakes in the morning the foot seems to be warm. An upright position has an immediate effect. He says, when that position is assumed, the leg seems to become cold to the knee. There is absolutely no difference in the appearance of the two limbs, whether he is standing or is lying down. The knee-jerk on both sides is equal and normal, the other reflexes good, as well as the electric reactions. The sensory appreciations of all kinds are natural. Both feet are flatter than they should be, but I could find no trace of tenderness in either. The temperature of the right foot was 1° F. higher than that of the left foot. On one occasion Seguin's surface-thermometer (arbitrary) marked 6° difference of the right as above the left; and these peculiarities of temperature were the same when the left foot was placed in the same physical conditions as the right. The sciatic nerves behind the knee were quite tender. I did not study the temperature-sense, as it was long ago, and I was not awake to the value of this as a symptom. Treatment proved of little value.

This case was, probably, also a neuritic affection. In some ways it resembles the remarkable cases which I described as erythromelalgia. In them, however, there were pronounced vaso-motor disturbances, with excessive pain. Of late it has been pointed out that in

some cases of positive neuritis the capacity to be aware of degrees of cold applied to the skin is present, while the like power to distinguish heat is lost.¹ This symptom existed in none of my cases ; but I may not have too carefully looked for it. I have observed it in hysteria and seen the reverse condition, and also that heat could cause pain when the needle did not. But this part of symptomatology needs careful re-examination. Meanwhile I may conclude that a sense of intense local coldness should cause us to suspect neuritis as a cause. I had last winter a sad case of general neuritis in a woman. Exercise increased it enormously, and when it became worse in any part there was in that nerve-territory a painful sense of cold, with very often rise of temperature and local enlargement of the veins, but no notable incapacity to discriminate temperatures.

I may add, as regards all these cases, that mere vasal states do not suffice to explain the false sense of intense local coldness. If they be of local peripheral origin, we must assume that the nerves are then constantly in a physical state such as is present when true cold is applied.

The condition of false sense of heat is to be met with, as is well known. For myself, I have never yet felt sure that there are distinct nerves for perceiving heat or cold. Another theory is possible, as I have elsewhere stated in regard to pain and touch.

My next case of intensified capacity to feel cold stands alone, but I am sure it will not do so very long. I owe it to the kindness of Dr. Kinnicutt. Exactly the reverse state is to be seen most often in the insane, but I

¹ George W. Jacoby : *Journal of Mental and Nervous Disease*, June, 1889.

reserve the cases of false sense of heat, local or general, for another paper. They offer greater difficulties.

CASE XLII.—L. P., Kansas, aged fifty-seven years, lawyer. When a youth, aged seventeen, the patient suffered from a renal complication during an attack of scarlet fever. Albumin has been found almost constantly in his urine from that date, and casts very frequently. He has, nevertheless, enjoyed good health, and although his urine still contains albumin, and hyaline and granular casts are occasionally found, he is in excellent condition, and performs all his varied legal duties easily. On careful examination there are no signs of cardiac or vascular changes. The heart is *not* hypertrophied. There is no marked arterial tension and no appreciable change in the vessel-walls.

For the past six or seven years he has been greatly annoyed by subjective sensations of cold. These sensations are general, but are particularly marked along the inner aspect of the upper arm; they are greatly increased by mental application. To relieve these sensations he wears at present three suits of the heaviest woollen underclothing, three pairs of the heaviest woollen socks, felt boots made expressly for him of the heaviest material, over his ordinary boots or shoes, and a flannel bandage around the abdomen. At night he wears two of the above suits, a flannel chest-protector, and the woollen socks. He sleeps under five double blankets, on a feather mattress with a hair one underneath. Moreover, he is obliged to keep the night-temperature of his room at 80°, and after an unusually hard day at court at 90° or 95°.

The only change of underclothing that he makes in summer is the doing away with one of the three suits. The sensations of cold are positively painful. I have made inquiry as to the truth of his statements concerning the amount of clothing worn, and they are borne out by my examinations. The surface-temperature is normal,

even when he complains most bitterly of his symptoms. He has a highly sensitive and nervous organization, with an active mind. He is well-balanced, cheerful, and philosophical about his sufferings. He walks from five to six miles daily without fatigue—on the contrary, with benefit. He is absolutely free from the ordinary symptoms of hysteria, and has no pain and no tenderness along the nerve-tracts.

This case is calculated to make us reflect upon the ordinary standards of heat and cold. They vary with individuals, with social classes, and with periods of life, as the aged well know. The present case is that of a man abnormally susceptible to cold. Explanation I have none to offer. It is interesting to be assured that a man may have tube-casts in his urine for forty years and yet preserve a standard of general health and activity.

CLASS III. Finally, I give a case of false sense of cold in an hysterical woman. Such cases must be rare. The reversed state I have also seen in the hysterical more than once.

CASE XLIII. (Case 409 in Private Note-book.)—Miss B., aged thirty-three years, Pennsylvania. The patient in this case was a young woman in easy circumstances, for many years a victim to hysterical conditions, first acute and afterward chronic. To describe her case would be to describe almost every form which hysteria assumes.

At seventeen she began to be irregular as to her menstrual periods, and at last passed into a condition of hysterical stupor, then into catalepsy, and later had for several weeks onsets of hystero-epilepsy. At last, coming out of this condition, she suffered for a long while from attacks of rigidity, the left leg finally remaining at an angle to the trunk and knee. Next, several months passed away,

during which she continued subject to slight hysterical attacks, and then by degrees improved so as to be fairly well. She was an emotional and very intelligent woman, fond of reading and devoted to music. She exercised but little, however, and was, when I first saw her, again drifting into a life of invalidism.

About two months before she came to me she passed over one menstrual time, and during the month which followed began to have a sense of cold on the left side of the body. This condition arose quite gradually, and became at last so violent as to compel her to wear, on that side, two or three times the amount of clothing required on the other. This excessive increase of clothing made her so ridiculously one-sided that she was ashamed to be seen in public. She continued to dress in this peculiar fashion, rarely leaving the house, and presented an appearance more easily imagined than described.

I first saw her early in February, 1883. She was then a woman of fair general appearance, with nothing notably wrong in any organ, and with all the secretions in good order. She had had no hysterical attack for several months. Menstruation was natural, almost without pain at her last period. At this time, however, she complained of a difficulty in swallowing and of a sensation as of a band around her throat. The whole left side of the body was still subject to the sensation of cold to which I have alluded, and which affected also the same side of the face, head, and neck. There was no loss of sensation to the touch on this side—in fact, there were hyperæsthetic spaces, one below the left breast and one below the floating ribs on the left. This region of tenderness continued to the middle line and down to the pubes. The special senses were normal, and there was no change in the color-fields.

In the discussion which followed Dr. James J. Putnam said: “In chronic spinal disease and in chronic

neuritis I have seen the coldness to which Dr. Mitchell refers. This was quite marked in one case which I shall report in my paper. This patient suffers from sensory neuritis which may possibly be due to lead. The sensation of cold is present to an extreme degree. In regard to the sensation of cold in persons not presenting signs of anæmic neuritis, I am not familiar with anything like what has been reported, though I have seen cases in which there were sensations of excessive heat, without organic disease."

Dr. C. K. Mills said: "I think that the sensation of cold is a very important symptom of neuritis. I have seen it in one case of acute neuritis of the ulnar nerve followed by paralysis of the muscles of the hand. During the hottest summer weather the patient had to wear a great deal of extra wrapping on the arm. Often a sensation of extreme heat follows injury of the nervous system, either peripheral or central. I recollect that after the attempted assassination of Garfield the description that he is said to have given of the feelings in his feet was that of extreme burning. I remember having expressed at that time the idea that the spinal cord was involved."

CHAPTER VII.

MOTOR ATAXIA IN A CHILD OF THREE YEARS, WITH
RETAINED MUSCLE-REFLEXES; PERNICIOUS ANÆ-
MIA, WITH LOCOMOTOR ATAXIA AND HYSTERIA.

THIS child, whose parents kindly permit me to show him to you, has a form of malady which I saw for the first time when I saw him last week. Here is a fine little man, well developed, exceedingly strong, and as intelligent as most children at his age. He is quite unable to stand alone. Even to sit alone seems difficult. No one will fail to note that he is ataxic from head to feet. The following notes of his condition at the present time are compiled from the examination record made by Dr. John K. Mitchell, and the very clearly written statement of the father:

CASE XLIV.—P. Q., male, three years and five months of age.

Family history. The child's grandfather was addicted to alcohol. The parents are second cousins, and much alike in disposition and general characteristics. There is also some tuberculous history in the ancestry.

The child was born normally at term. No instruments were used. The only thing attracting attention at the time of birth was "something unusual" about the little one's ankles. The physician said it was "all right," and the babe seemed otherwise healthy; the child cried, kicked, nursed from the breast, etc. Owing to mammary abscesses the mother nursed the infant no more than four weeks

After that the child lived on non-sterilized cows' milk, and later on "malted milk" and other artificial foods until eight months of age, and with sustained good health.

At that time, however (eight months of age), the child was taken on a railroad journey. It is supposed that "sour milk" was the cause of a severe attack of diarrhœa, which resulted, a few days later, in what the physician writes was "spurious hydrocephalus; the temperature 103.5° F." The child threw its hands about, especially toward the head, and moaned a great deal. It had also "intolerance of light" at this time.

The physician gave a cool bath and a dose of brandy. By the next day the patient is said to have recovered from the serious symptoms, including the diarrhœa.

After this attack of bowel-trouble digestion seemed as well performed as usual. Two months later (*i. e.*, at ten months of age) it was specially noticed that the child could not sit erect. Nothing had seemed abnormal until now other than undue lassitude. On examination, Dr. J. S. Hackney found that "there was an antero-posterior curvature of the spine," the most prominent point being about the mid-dorsal region.

Accordingly a plaster jacket was applied. This was cut and removed as often as necessary. There seemed to be some relief from this for the now evidently weak back. The jacket was worn for six weeks.

The little patient has kept up a general good tone since then, the back seeming to have become straight and quite strong again; nor has he had any bowel-complaint since that in his first summer.

The present condition seems to date from thirteen months of age, when the child began to have an oscillatory movement of the left eye and later of the right eye. This nystagmus was always the more noticeable in the left eye. At this time, too, his health was good. He seemed some-

what nervous, but did not have any convulsive movements, and never has had any such tendency.

At fourteen months of age he had an attack of bronchitis. In the second week of this illness symptoms of what was said to have been tuberculous meningitis made their appearance. Both bronchial and meningeal symptoms, however, disappeared during the third week. Since then and until now the child has enjoyed very good health, excepting for extreme nervousness during the illness stated. He now became easily startled and scared. This timidity has become more apparent as he grows older. He is at present unusually sensitive. His father says the mental faculties are normal or even precocious.

The child did not move about if placed on the floor until two years old. It has only been since January, 1894 (three years and two months old), that he has begun to pull himself up to a standing position with his arms and the aid of a chair, bed, etc. Now, when up, he can walk along the side of the bed or balusters, holding firmly for support. This ability has been acquired only within the past few months. Even when thus holding himself upon his feet he seems in fear of falling.

The patient has been extremely constipated until about a year ago. Since then the bowels have been reasonably regular. This change has probably been brought about by the greater physical exertion of attempted movement.

The child is rather pale; the muscles are fair in size, but very flabby. The head is large, but symmetrical. The chest is large—indeed unusually full for a child. He does not crawl, but he can shuffle about, seated; he can walk about when supported, but with a marked ataxic gait and with feebleness. He jerks the legs forward in the effort at locomotion. The *erectores spinæ* are weak. The abdominal muscles and thigh muscles do not hold the body steadily upright on the legs. He leans too far forward or

back. The tendency is more backward, however, when he is thus supported. He cannot feed himself.

Incoördination is marked in the hands, but there is no tremor. He uses the left hand better than the right, and possibly the left leg a little better than the right one.

Nervous system. Sensation is perfect everywhere. Knee-jerks and elbow-jerks are normal and no ankle-clonus exists. Muscle-jerks of the arms and legs give normal response on stimulation with the percussion-hammer. Electrical examination shows no alteration to faradism or galvanism. The child seems intelligent and alert, though timid and nervous. No signs of pain were elicited at any time during the examinations. He talks fairly, drawls his words somewhat, but speaks freely. The mouth and teeth are normal. There is no preputial adhesion, no incontinence of urine, and this excretion is normal.

Eyes (examined by Dr. A. G. Thomson). The "pupils react normally to light and accommodation. There is no choked disc. The nystagmus of both eyes and the convergent squint of the left eye are, therefore, not due to any refractive error," but are incoördinate movements, such as are seen in other parts of the body.

All other functions and organs are normal.

It seems reasonably clear that the cause of this interesting malady was not prenatal. The child remained well until he had the too common experience of summer diarrhœa, followed, as we see so often, by brief brain-symptoms. What happened then is not now clearly known. He is said to have had "spurious hydrocephalus," and was, according to the note, very ill. At or after this time he could not sit up as he had been able to do. At the thirteenth month nystagmus began, or was first seen. Then followed a bronchitis and brain-symptoms described as "tuberculous meningitis," and

from this too he got well, but was seen to be more and more awkward as he grew older.

I confess to some puzzle in this case. There are no eye-ground signs. There is no wasting. There is no palsy of any nerve. There is unusual power from crown to sole; there is no sensory loss, and yet he cannot stand at all without some stay. Aided by a finger he can walk, throwing his feet out, and "clumping" precisely like a true spinal ataxic. But no such case in an adult had ever such a degree of disorder without disturbed feeling, or pain, or anæsthesia, or girdle-pain, or pupillary signs. Here are none of these. Also, the ataxia is in all the limbs, but is worse in the legs. In the arms and legs, to my surprise, I found normal tendon-jerks, so called, and also normal reinforcements of these muscle-reflexes. There is nothing spastic in these. Sometimes they are excessive, probably from reinforcement due to emotion. There is no clonus; but this is rare in the child under any conditions. If this were spinal ataxia, with added lateral sclerosis, we should have spastic reflex signals and the usual feebleness apt to be seen in that disorder; also the high ataxic movement of the feet seen in our case would be wanting.

Tabes of all kinds is, as a rule, progressive. The lad before you continuously improves in the use of his limbs. This is, therefore, neither tabes nor spastic ataxia, nor is it the picture of hereditary ataxia; neither has he pain-crises nor trophic changes, so that probably the posterior nerve-roots and the gray spinal centres are to be excluded from a share in this disorder.

It seems to me possible that the double brain-diseases he is said to have had, and which left his power of

mind and of muscle unimpaired, may have fallen on the cerebellum and left it permanently injured in one of its functions. As against this is the lad's gain in steadiness; but even with most of the cerebellum gone birds have after a year been able to fly. The mechanisms of replacement of function are not as yet clear to us, although we are often called on to recognize their value.

It is possible that the cerebellum may have suffered over a large area of the surface, and that this damage may have been in part repaired, and a share of the functional activities safe-guarded and replaced by the other mechanisms which contribute to the integrity of equilibration.

I cannot say, however, that I am, even now, entirely sure as to a cerebellar lesion being the true cause of the ataxic state seen in this child; but it cannot be spinal unless the ataxia of childhood should prove to be a very different condition from that of the adult—an ataxia without sensory, ocular, or reflex symptoms. If we had any evidence of tumor of the cerebellum, we should be aided in our diagnosis. In it there may be preservation of the knee-jerk, but we have here no sign of tumor.

I confess, as I study this case, to increasing difficulty of decision; as one looks at it, the case is to the eye a typical spinal ataxia; examined more nearly, much is lacking to make the perfect picture of that disorder or disease. But almost as much is also wanting to assure us of a cerebellar origin; and one should remember, I repeat, that we have hardly any studies of spinal ataxia in childhood. I reported one years ago, which came out

of Pott's disease, at the age of five, and was seen by me in a woman of forty. It had progressed in leaps, with long periods of pathological inactivity.

When so thoughtful a man as Gowers admits that the grouped symptoms seen in locomotor ataxia may be due to disease either of the cord or of the peripheral nerves, one sees the tangle into which we have gotten our knowledge of the mechanism of harmonious muscle-action, and its offspring, equilibration.

As there may be much loss of motor power, much impairment of motor centres and nerves, without corresponding loss of muscle-harmonies, we must, I think, still look to disease of the nerves of muscular sensation, their spinal tracts, and their cerebellar connection, for the varied seats of the incoördination of complex muscle-acts.

It is conceded that integrity of the knee-jerk, or any tendon-jerk from a blow on the tendon, implies wholeness of the neural arc of conduction and response from the centres concerned. When there is distinct, typical ataxia without spastic states, and with normal preservation of knee-jerk and ankle-jerk, it seems reasonable to conclude that the cause of this ataxia must lie above the region concerned in the muscle-muscle-reactions.¹ The law which applies to knee-jerks and all tendon-jerks explains *in part* the direct muscle-jerk from a blow. For here, as Morris Lewis and I have shown, this response is due to two contributions, one the intrinsic muscular irritability, and one the addition from the cord. The former continues after nerve-section; the latter is lost, but its loss is only to be proved by the fact

¹ Contra-distinguished from skin-muscle-reflexes.

that you can then no longer reinforce the direct muscle-jerk by remote voluntary motion.

Such is the case late in posterior sclerosis. A blow on the muscle causes a jerk, but reinforcement is no longer possible. The response from tendon-jerk is only a finer, a more delicate, expression, and a larger one, of the same phenomenon. In this boy neither muscle-jerk nor tendon-jerk is gone, nor yet their reinforcement.

The facts as to all this matter of sensory motor as well as motor reinforcement in its varied forms, discovered by Lewis and myself, remain as yet almost unnoticed in the text-books, and unused by clinical inquirers.

As regards this boy I conclude, then, that the cause of his remarkable ataxic state must lie above the seat of response to the tendon-jerks, and does not interfere with the track of reinforcement, which is easily obtainable.

I must leave this case and its consideration without further words. I do not fully understand it, and the frank statement that I do not may have for you some moral value. Under training, with constant little bribes to do this or that until he succeeds, the lad is steadily improving, and has continued so to do up to the later date of July, 1896. Even ordinary ataxics may improve by industrious efforts made with closed eyes, and this child has in his favor a normal mind and entirely wholesome nutrition.

An equally interesting case for study is a woman now in McCormick ward. Dr. Walker will read the notes, which owe much of their interest to Dr. Musser, in whose charge she has been at the Presbyterian Hospital; and to Dr. Pearce, who is responsible for the

blood-counts made for Dr. John K. Mitchell's paper on the influence of massage on the blood-count.

I shall presently show you the case. It is another illustration of clinical difficulty in decision. Here again we have an example of ataxia, typical and also extreme, with, save for one notable exception, perfect knee-jerks and elbow-jerks and entire muscle-jerks from a blow, and all reinforcible:

CASE XLV.—E. I., female, single, aged fifty years, was admitted to the Infirmary for Nervous Diseases, in my service, March 2, 1894. She is intelligent, and gives the following history as to her illness, amplified by the observations at the Presbyterian Hospital and by our later notes:

Family history. The woman is of a long-lived ancestry. Her father and mother are living and well at eighty-two and seventy-five years respectively. Three sisters are all healthy. Two brothers have died of scarlet fever and dysentery, and one sister in infancy. There are no neuroses or psychoses among her relatives, and the patient herself had an uneventful childhood as regards maladies, passing through mild forms of the usual diseases of youth.

In 1887 she suffered from the ordinary symptoms of nervous exhaustion, had anorexia, and felt tired most of the day. These symptoms ran the course of many of such cases when ill cared for. After an attack of influenza, in 1889, she was almost bedridden for a year from what she says was "weakness" only.

She was about again for several months, able to walk with a cane, but could not bear much exertion. She was especially weak in the spine and had considerable pain across the lumbar region. The patient also states that at this time she always had better use of the right foot than of the left—the latter was heavy and seemed to "drag" in walking.

She continued in this way with but little change in the foregoing meagre symptomatology until July, 1890, when she went to the Cooper Hospital, Camden, remaining there three months, with little or no improvement; thence she was taken to the Presbyterian Hospital, Philadelphia, where she stayed in the wards one year. There she was in a highly neurotic condition, and had hysterical outbursts of crying and laughing. The sequelæ of these climaxes (which occurred, as a rule, near the menstrual epochs) were states of lethargy and again of fear, in which temporary hysterical delusions became prominent. The sick women about her were often much frightened by her peculiar, wandering talk. In a few days she was apt to regain partial control, and would censure herself for acting so foolishly—of which, however, she had only vague remembrances. At this time, too, she seemed able to walk only with the assistance of a nurse, and but for short distances. Her upper extremities also were weak, and she was clumsy. It was, therefore, with difficulty that she fed or assisted in dressing herself. Under rest and tonics there was improvement of the general health, and on leaving the hospital she was able to walk a short distance with the aid of a cane. She was then at home from March to November, 1892, when she was readmitted to the Presbyterian Hospital, where since then she has had a multiplicity of symptoms.

Menstruation was normal up to June, 1893. In July she had a severe attack of dysentery. The convalescence was slow, and she was left very anæmic, the blood-count showing as low as 581,000 red cells on August 1st of that year. On September 1st the blood-count showed 950,000 red cells with macrocytes, microcytes, etc. On October 18th the red cells had increased to 1,620,000. The patient's condition seemed now fairly good. Her color had returned in a measure, so that the outlook seemed more encouraging. There was no men-

strual flow between June and October, in which latter month she had a slight show, which recurred again in November, but never since.

By January 1, 1894, there was no material change, save that in the last few days she was decidedly more anæmic again, and had headache, dyspnœa, weakness, and palpitation of the heart on the slightest attempt at exertion, with œdema of the ankles coming on late in the afternoon. There was no œdema of the face. The skin has become of a lemon-yellow color and the conjunctivæ of a bluish tint. Her lips are almost colorless.

The apex-beat of the heart is in the fifth interspace. No thrill is felt. The shock of the second sound is readily felt in the pulmonary area. The area of cardiac dulness is normal. There is a soft, hemic, systolic murmur, low in pitch, transmitted into the axilla, accompanying but not obliterating the first sound at the apex. There is also a higher-pitched systolic murmur (probably hemic) heard in the pulmonary area.

The area of liver-dulness is slightly increased. There is one tender spot on palpation with the finger-tips to the right of the median line two inches, and another two and a half inches above the umbilical line. On January 16th the patient had severe pain in the region of this tender spot, with great pallor and increasing weakness, so much so that duodenal ulceration and possibly hemorrhage were thought of. Dr. Musser had the stools carefully examined. No blood was passed, however, and no parasite could be found as a cause of the severe anæmia. The hæmoglobin had at this time gone down to 15 per cent., while the red blood-cells numbered 930,000. There were also poikilocytes, macrocytes, and microcytes in abundance, while macroscopically a drop of blood looked like slightly tinged muddy water.

By February 22d the patient's skin and mucous

membranes had again brightened. Her general condition also became much improved. She was decidedly less nervous, and sat up a short time in a chair each afternoon, but tired easily and could not walk.

On admission to the Infirmary, March 2, 1894, the following notes were made as to her condition: She is a brunette, fairly well nourished, weighing 129 pounds. She complains of a feeling of "numbness and tingling" in her hands and feet. She says if she undertakes to hold anything in her hands she must *see* it in order to feel sure that it is there. She can feed herself, but her hands are too clumsy to permit of her cutting her food. She cannot dress her hair. She can button her night-dress, but clumsily, and only as far up as she can see the buttons. These defective acts seem to be all due to awkwardness rather than to actual loss of tactile sense, which seems perfect in the hands and fingers. The disorder is mainly a motor ataxia. There is no subjective numbness or tingling anywhere except in the hands and feet. She does not complain of headache. She has pain in the back after any exertion, such as sitting up. She can stand *only* by being supported on either side; she takes a few steps while being thus held, but the movements are markedly ataxic. The left foot is *pushed* forward. The right one is thrown up and out in utter incoördination.

In the sitting position, unsupported and with eyes closed, she does not sway.

Other than by the characteristic gait, ataxia of the lower extremities is shown by an inability to bring the heel of either foot in contact with the opposite instep. Ataxia of the upper extremities is shown *even when lying* by inability to bring the fingers of the outstretched hand to the nose with the eyes closed. The movements of the lower extremities are less incoördinate when she lies supine.

The reflexes—plantar, epigastric, and abdominal—are

normal. The knee-jerks are also normal and reinforcible. There is no clonus. There is absence of the normal ankle-jerks, as tested by tapping the tendo-Achillis, but they can be elicited by reinforcement. The elbow-jerks are normal and reinforcible. The muscle-jerks are everywhere normal and reinforcible.

Sensibility. She distinguishes with natural competence the two points of the æsthesiometer when placed on the fingers, and points out quite accurately the fingers so touched. There seems to be some delay in decision. Tactile sensation on the palmar and dorsal surfaces of both hands is normal. The *thermal sense* is perfect. As to the weight (or muscle-) sense, on holding the palm of the hand out (the patient being blindfolded) she distinguishes a difference between the following weights—*i. e.*, “the least observable difference” of Weber’s law:¹ The right palm distinguishes one ounce from two ounces only; the left palm tells one-quarter ounce from one-half ounce. Thus there is a difference in muscle-sense between the right and left arms, and the perception is not as acute as it should be. Numbness and tingling sensations are complained of in the hands and feet. No such paræsthesia exists in other parts. There is no anaesthesia or hyperæsthesia, but there is varying analgesia to a deep pin-prick, as follows: The left lower extremity is analgesic from the groin to the

¹ Weber used the method of “least observable differences” as applied to sensations of pressure and the measurement of lines by the eye, but Fechner expanded it and assumed that all just observable differences are equally great; so that the law is sometimes called “Fechner’s law.” Expressed in another way, the results depend on (1) strength of stimuli; (2) degree of excitability. If *two* is constant and *one* is then varied, it is found that if the stimulus be doubled, trebled, etc., the sensation only increases as the logarithm of the stimulus (*e. g.*, stimulus 10, 100, and 1000 times, then sensation increases 1, 2, and 3). There is a *lower limit of excitation liminal* intensity and an *upper limit of excitation liminal* intensity. Thus above this no appreciable increase in sensation can be distinguished. This is called the “range of sensibility.” Thus, with 10 grammes in the hand, we have to add or remove 3.3 grammes before a difference in sensation is perceptible. In 100 grammes we would have to add or withdraw 33.3 grammes.

metatarso-phalangeal joints, and the right upper extremity from midway between the shoulder and the elbow to the metacarpo-phalangeal joints. The condition of analgesia of the upper extremity is variable, however, as twenty-four hours after the first examination sensation to pain seemed almost as acute as upon the opposite side. The right leg and thigh are at times partially analgesic to a pin-prick, but the areas of defect vary greatly from day to day.

Dr. Willits reports the muscular response to faradism everywhere normal.

Drs. de Schweinitz and A. Thomson made the following eye-report: "Both discs gray, especially in the deeper layers. Arteries too small, veins normal. Pupils normal. Color-fields (red and blue) *typically reversed*. Form-fields contracted."

The reaction-time of the different senses was next investigated.

Mr. Lightner Witmer kindly made examinations of this woman for me at the Psychological Laboratory of the University of Pennsylvania, on March 27, 1894, from which the following is abstracted:

First, as regards the motor nervous system, as recorded on the chronoscope (an instrument for recording the rapidity of a motion). It was found that to pass over a distance of 50 cm. it took the right hand $\frac{224}{1000}$ of a second (*i. e.*, 224 σ). In the left hand $\frac{241}{1000}$ of a second was required to pass as quickly as possible over the same distance.

A second series of these motor impulse experiments (made *after* all the reaction-time experiments) was but little lengthened as compared to the first series, thus pointing to the absence of fatigue of any considerable amount.

The normal rate of movement, from the experiments of Professors Fullerton and Cattell, varies between 87 σ to

180 σ for 50 cm., as recorded on the chronoscope. The woman's movements were therefore slow.

The reaction-time to sound varied from 181 σ to 343 σ , somewhat longer than the normal, which ranges from 120 σ to 170 σ .

The reaction-time for light varied from 160 σ to 350 σ . The normal light-perception is from 160 σ to 200 σ .

The reaction-time to electric shock varied from 200 σ to 476 σ , a very marked retardation—and this, too, while the muscle-response to faradism seemed normal. Here is one of the enigmas appearing in this curious case.

There is thus a general tendency to slowness of perception. The receptive centres have at least become dulled.

The patient's general health is fair. All organs seem normal, excepting that the bowels are a little torpid. She has good control over the bladder, and analysis of the urine is negative. Sleep is undisturbed.

The color has returned markedly since January, 1894, the red blood-cells numbering 3,200,000 and not being altered in shape or size. The hæmoglobin-estimation is 60 per cent.¹

The case as you hear it must strike you as peculiar. Reading this story backward, so to speak, the paresis, the anorexia, the type of mental disorder, all point to hysteria. Then we have added a dysentery, which leaves her with such anæmic conditions and accompaniments as, for a time, seem to make the diagnosis of added pernicious anæmia probable. The history of the development of the remarkable ataxia is not complete, but its presence is to-day her most obvious symptom. Note

¹ After the administration of pyrophosphate of iron in divided doses up to 95 grains in some 70 hours the blood-count showed increase of red blood-corpuscles to 4,160,000, and of hæmoglobin to 70 per cent. See Dr. John K. Mitchell's paper on Blood-counts,

also the facts of varying analgesia, the typical changes in the color-fields, the equally curious alterations in these, and you have before you a case of hysteria with the very unusual additions of pernicious anæmia and ataxia of motion.

As you see her walk, with the aid of two nurses, she usually lifts the feet high, and throws them, so to speak, in a disorderly way. With shut eyes her motions are all worse, as you may perceive when the ataxic hand-movements are thus studied. You would have no doubt, at sight, of hers being a case of typical posterior sclerosis, and still less doubt if you recall the fact that she cannot tell the difference as between the weight of a penny and that of a silver dollar. The exact facts are better related in the case-notes. Apparently she has more or less defect of the sense of amount of muscular exertion put forth—loss of muscle-sense.

Naturally, I look with suspicion on an hysterical woman long in hospital wards; but as to the facts I have stated I do not think we were deceived. I shall presently return to this matter of loss of muscle-sense.

Considering the case as ataxic, such as we see here at every clinic, you should be surprised to find, as I now show you, that we have normal knee-jerks, elbow-jerks, and muscle jerks, and also normal reinforcements. The responses are not spastic, and the limbs are not like those of people with lateral columnar disease and “lead-pipe” passive flexion. There is no clonus; I can get no ankle-jerk by a blow on the tendo-Achillis, or on the sole of the foot. I *can* call out this response by motor or sensory *reinforcement*. But for this remarkable exception I should have almost no indecision

as to how to characterize this deeply interesting case. Perhaps I should not give too much importance to the partial loss of ankle-jerk, especially in a case so profoundly hysterical. Is this case, then, an hysterical ataxia due to hysterical loss of muscle-sense? That this should be, along with preservation of muscle-reflexes, and with no loss of tactile sense, and only variable cutaneous analgesia, would be interesting and unusual, and, let me admit, a little puzzling. Hysteria confuses, but does not exclude organic spinal maladies, and the partial loss of the lowest muscle-reflex is suspicious. But there are no other signals of posterior sclerosis: no pain, no reflex losses in the ataxic arms, no eye-signs.

Briquet, whose pictures of hysteria look to me a little too vivid, described a form of ataxia due to loss of both skin-sense and muscle-sense. He seems to think that the loss of the latter is not to be met with until the former has become positive. With this double loss comes incapacity to effect a motor purpose without seeing the acting member. With view, he says, the muscular acts are perfect. This is not the case in our patient; nor do I think it ever is in these cases precisely as he states it. The sight helps the true hysterical ataxic, but does not enable her to attain ease and perfection in her acts.

The interest of our own case lies in the isolated loss of pain-sense, without corresponding absence of cutaneous tactile sense. I have often seen more or less surface-anæsthesia with more or less or no loss of muscle-sense. The great defect of this latter seen in our present case, without any notable tactile loss, is

more than merely uncommon. Again, with the ataxia and failure to estimate differences in weights, we have complete muscle-reflexes.

CASE XLVI.—In the same ward is a girl of twenty-two years, who has the more common form of hysterical ataxia which I described many years ago. She is now nearly well, but a month ago her walk was a thing most interesting to see. She walked as a jointed doll endowed with life might walk—a succession of jerky, abruptly ended movements, with sway of head and body back and front or to right and left. For a fuller account I refer you to my original delineation of this singular form of disorder.

The patient was put alone in a room, given very decided faradic currents to the muscles with the wire brush on a dry skin, and daily full massage, with iron and arsenic.

She has been rapidly improving. At first, to aid her steps, she used the device I described long ago as crutch-canes: but she can now walk unaided; she has deserted her bed; knits and sews, and seems a prosperous case.

April 23, 1894. Her station is good with closed eyes. Sensation is now normal in all forms, and the obvious delay in perception exists no longer. She can walk clumsily some twenty feet unaided.

Up to May 20th my records describe increasing gain. She walks a few steps unaided, but still prefers to help herself with the crutch-canes. She was rarely in bed; knitted, sewed, and used scissors.

At this time her station-sway with closed eyes was hardly more than normal.

Soon after I left my service, in early June, the knee-reflexes began to grow less and less responsive, and the blood-counts fell to 1,600,000, the hæmoglobin to 20 per cent.

September 1, 1894, she died. I add Dr. Burr's post-mortem notes :

"At post-mortem I found quite marked emaciation. Skin lemon-yellow. Subcutaneous fat small in amount, orange-yellow in color. Muscles very dark red. Blood liquid throughout the body. Heart normal in size ; cavities contain a little semifluid blood ; walls, average thickness ; muscle brownish ; very slight, old thickening of mitral valves. Liver slightly fatty. Lungs, kidneys, and spleen showed nothing noteworthy. No gastric atrophy. Tibial marrow currant-jelly color, broken-down, cancellated bone tissue. Many nucleated red corpuscles. Cerebral membranes and brain normal ; spinal membranes normal. On cross-section of the spinal cord the posterior columns are pearly gray.

"*Microscopical examination, highest level of cervical cord.* Very marked degeneration of the posterior columns, except a narrow level along the edge of the gray matter. In the lateral columns in the region of the crossed pyramidal tracts, but not confined strictly to them and not in contact with the posterior gray matter, is an area of much slighter but still quite marked degeneration. Running round the periphery of the lateral columns and reaching quite far forward is an irregular band of not very marked degeneration. The intensity of the lesion varies much. It is patchy, greater here, less there. The remainder of the white matter and the gray matter normal. Peripheral nerve-roots normal. No meningitis.

"*Cervical swelling.* The same condition obtains.

"*Upper dorsal region.* The condition is the same, except that the band of healthy tissue between the gray matter and the posterior columns is wider and there are quite a number of healthy fibres in the periphery of the latter. Marked degeneration of the crossed pyramidal tracts. Cerebellar tract fairly normal.

"Lower dorsal region. The same.

"Lumbar swelling. Slight degeneration of the postero-internal column; very slight of postero-external. A small area of degeneration in the crossed pyramidal tract.

"Histological examination. There is a very fine and very dense network of connective tissue. No increase of blood-vessels and slight thickening of their walls. There is no histological difference between the lesion in the posterior and that in the lateral columns. Median and sciatic nerves normal."

To sum up, here is a case of hysteria on which are grafted later the typical symptoms of pernicious anæmia with its ordinary deceitful rise and fall of blood-counts. At an uncertain period we have the further addition of an aberrant type of locomotor ataxia due to organic disease of the cord. The changes for the better in the way of motion and loss of analgesia were due to an improvement in the group of hysterical symptoms.

I shall rarely be able to show you so interesting an example of the combination of three distinct maladies, nor of the diagnostic confusion which grave hysteria brings into the study of organic disease. Looking back, the case appears plain enough.

CHAPTER VIII.

POST-HEMIPLEGIC PAIN; PRE-HEMIPLEGIC PAIN;
POST-HEMIPLEGIC DISEASE OF JOINTS; POST-
HEMIPLEGIC NODES.

THERE is some danger lest amid the attractive fascinations of novel bacteriological study we may lose sight of the more every-day need for incessant clinical watchfulness as to the lesser symptomatic novelties which are yet to be detected. The case which I show you to-day may very well illustrate my meaning. It is of considerable interest on account of the early date at which joint-disorder followed an attack of hemiplegia. I shall presently speak to you further of its nature and explanation. It reminds me to ask your attention to pain as among the occasional prodromes and sequels of hemiplegia; also to a somewhat novel matter—the nodes which occasionally appear as sequelæ of this paralysis.

The late Prof. John K. Mitchell first called attention, in 1831, to the production, through spinal injury and sequent disease, of joint-lesions often distinguishable with difficulty from the lesions of rheumatism. Allison, in 1838, described joint-lesions following hemiplegia. Drs. Morehouse, Keen, and myself reported numerous examples of joint-trouble caused by peripheral nerve-lesions, and since then I and others have added largely to the literature which deals with nutritive changes occasioned, early or late, by cerebral and

spinal disease, and by the diseases or traumas of nerve-trunks.

It is now generally admitted that the joint-disorders which occasionally follow hemiplegia from cerebral lesions owe their origin to a descending degenerative change involving the motor tract and finally the cord. If this be so, we must also admit that these changes are in certain cases very rapid, as I have now seen at least four cases, all of right-sided cerebral lesion, in which one or more joint-lesions followed within four days. Then there is, too, a small group of cases not alluded to in the books, in which the sequence is as follows:

1. Primarily, unilateral pain in muscular or fibrous tissues and great soreness.

2. Tenderness of certain joints, slight swelling, and pain *on only one side*. Repeated attacks strictly limited to one side.

3. *Subsequent* cerebral clot and paralysis of the painful side.

4. Increase of joint-lesions on the palsied side alone, and generally chronic unilateral joint-trouble.

Another type, which, like this, gives us occasion enough to reflect, is this:

1. Long-continued, or occasional, muscular aches on one side only, without heart-disease or gout, and with no joint-troubles.

2. After a year or two paralysis of the side thus previously affected.

3. Secondary joint-lesions on the same side, becoming chronic.

In a third class, which is somewhat rare, we have as an *immediate* prodrome of hemiplegia acute pain in

the muscular masses, so as to be taken for muscular rheumatism, but confined to the side which within forty-eight hours becomes hemiplegic. The following brief case-sketches may answer for illustrations:

CASE XLVII.—C. S., aged fifty-two years, a house-keeper, in general good health and free from cardiac, renal, or gouty troubles, was attacked in 1880, in the early spring, with pain and soreness in the shoulder-muscles and in the thigh of the right side. The attack was sharp, but lasted only a week. It was repeated a month later, and again and again, with more or less swelling and tenderness of the shoulder, finger-joints, and knee on the right side only. The last two attacks were accompanied with headache and slight vertigo. The final attack was limited to severe ache in the arm and leg, and after three days of great pain there was sudden loss of power of the whole right side, with loss of sensation. This last was brief; but the motor loss was more grave, and there was never entire recovery of motion in either leg or arm. On the fifth day the shoulder became swollen and tender, and a week later several of the finger-joints suffered in like manner and finally the knee. There was early and, at last, late rigidity of the arm-muscles. None of the joints got well. All passed into a state of subacute inflammation, and death followed a second hemorrhage within eighteen months.

In this case the joint-lesions were seen before and also after the cerebral lesion.

CASE XLVIII.—M., aged sixty-four years, a physician, was well as to heart, kidneys, and arteries, which to appearance were unusually free from disease. For two years before his paralysis he was subject to nearly constant pain in the muscles of the right arm and leg; occasionally, but rarely, he had slight pain in the right knee- and shoulder-

joints ; none in the smaller articulations. Occasionally the pain was so severe in all of the right-side muscles of limbs and trunk as to confine him to his bed for a week. There was never pain on the left side.

In June, 1859, a violent bout of pain, still only on the right side, was followed on the second day by sudden and incomplete loss of use of the right leg and arm, without disturbance of consciousness or of sensation. Within the next three years he had three attacks of hemiplegia, none severe, but each of them preceded by a similar onset of muscular pain and tenderness. He finally died of pneumonia.

I saw many years ago a middle-aged woman, who was seized, without known cause, with violent pain in the right arm and leg. There were no joint-lesions. The pain was agonizing. Within thirty-six hours she had a quite complete attack of hemiplegia on the same side, after which the pain slowly faded away and never returned. She made a good recovery and died, years after, of lung-disease.

I could readily add to these cases. To observe one-sided pain or joint-lesions as prodromes or remote antecedents of cerebral lesions is not exceedingly rare. I have seen one such case within a year, and in it the muscular pain, as is not uncommon, slowly passed away with the paralysis.

It is, of course, easy to dismiss these as cases of the coincidental occurrence of rheumatism and brain-lesions ; but this will hardly satisfy the modern clinical observer. Certainly they should suggest inquiry as to whether or not incipient brain-lesions, finally productive of paralysis, may not, either directly or through an influence

on the cord, occasion morbid phenomena simulating rheumatic symptoms.

It is conceivable that the many cases I have seen may, one and all, represent the coincidental occurrence of unilateral rheumatism with a sequence of hemiplegia. But there is another explanation which is possible, and for this reason I desire to call attention anew to the antecedents and consequences of certain hemiplegias. If, as I and others have seen, inflamed joints may follow within from one to four days upon hemiplegias, it seems unlikely that their presence can be due to organic spinal changes, or to these alone, unless these changes be far more rapid than we at present conceive them to be. If they are due directly to the immediate influence of the brain-lesion or to its effects on the yet unaltered cord, then even the joint-lesions, which are more remote in time, may have a like origin. Really, it does not as yet seem to be quite sure that the cord is always or alone responsible, or that the joint-troubles as well as the pain may not have their primary origin in the cerebral centres. And at all events we need careful study of the motor tracts in cases of early death from cerebral disease.

Another rare consequence of hemiplegia is the, as yet, undescribed occurrence of nodes of the periosteum. These still further add to the rheumatic picture presented by certain palsied limbs. I speak of these nodes as being, so far, undescribed, for in a wide search I find no mention of them, and they appear thus far to have escaped the attention of clinical observers.

I first saw them some years ago in a workman about forty-five years old. He was a plumber, but had no

evidence of lead-poisoning, which, in fact, is scarcely ever seen in this class of mechanics. The patient had never had any genital malady, and was in good health until he had, after overwork in hot weather, an attack of left hemiplegia. Unconscious for a day, he made a fair recovery, except as to his arm, in which during two or three months developed late rigidity and joint-lesions. The knee, which is rarely affected, suffered, although slightly. In examining with care the state of this man's joints I found, about three inches above the ankle, an elongated, very tender node about an inch wide, and at the insertion of the deltoid a second, still more prominent. Interested in these lesions, I asked Dr. Maury, as an expert in syphilis, to examine the case. He came to the conclusion that there were no evidences of this malady, which, I may add, the man positively denied having ever had. A long and active course of treatment with iodides and mercury failed to alter the nodes in the least degree, and I came at last to the conclusion that, like the joint-lesions, they were indirectly the offspring of the cerebral malady. I have since then seen similar cases, but of these I have no notes.

The case I now show you came first under notice in 1891, and is the earliest example of joint-lesion following hemiplegia which I have ever met with. It also shows to this day the interesting nodes to which I desire to call attention:

CASE XLIX.—G. W., aged fifty-eight years, is a manufacturer in active business, of good health and habits. He indulges in moderation as to wine and tobacco. He has never had syphilis, and there is no obvious disease of the heart or vessels, and no renal disorder. He is

subject at times, for a week or more, to deposits of urates in the urine passed at night. On July 20, 1891, after a severe mental and moral strain which necessarily lasted during four hours, he went to a friend's house to rest. As he was about to lie down he reeled and fell. The left arm, on which he leaned against the bed, was somewhat twisted, and possibly strained, as he fell. He was found unconscious, and with complete paralysis of the left side. In twenty-four hours he was conscious of his surroundings. His speech was long affected, and the tongue was protruded far to the left. The leg recovered fairly well, but when first seen by me—November 10, 1891—the foot still dragged a little; the left arm was helpless.

The day after the paralysis he felt pain in the shoulder and down the outside of the arm. From this date he had increasing pain, swelling, and tenderness in this joint. In August the elbow became painful, and early in September all the joints of the left hand were inflamed. There was early rigidity, and, later, extreme rigidity, with violent contraction of the forearm-muscles, so that the nails indented the palm. There had been little gain as to these symptoms, but the pain has become less severe. At the deltoid insertion a node, three inches by one, of irregular form and quite prominent, could be felt. It was plainly periosteal and painful in varying degrees. On the ulna, above the wrist, was a second node, and above it a smaller one, both very distinct and also tender.

The foot was somewhat contracted. All the nails on the palsied side grew very slowly for two months. Sensation was slightly defective as to touch only on the palmar faces of the first and second digits.

The tongue was protruded to the left, and speech was not quite perfect.

When seen, in May, 1892, there was less pain, but all

of the joints of the left arm were tender, swollen, and useless.

The nodes are still to be felt, although they vary in size, and are at times larger than now.

This case is to me very interesting. It is possible that the shoulder-joint may have been twisted in the fall, and that this accounts for the very early inflammation, which, later, may have owed its continuance to the paralysis. I have, however, seen one case in which the joint-lesion came on within thirty-six hours, and other cases in which it came on within four days. Therefore, it is possible that in the present example the shoulder-trouble may have been the immediate offspring of the brain-lesion alone.

The mechanism of the production of these very common incidents of hemiplegia is still a difficult question. Perhaps a careful study of the post-mortem chemical state of the limbs may help us; but it should be made immediately after death. It is quite possible that the nutritive disturbances of a palsied limb may evolve, locally, products which give rise to these pseudo-rheumatic appearances. Peripheral nerve-lesions clearly alter the skin-secretions, as I have elsewhere shown, and they may as likely evolve within the limb chemical products favorable to the evolution of joint-disease. It is not enough to say that this is caused by altered nutrition. The nodes I describe are also one more addition to the points of clinical resemblance between a palsied and a rheumatic limb, and, small as is their importance, it is, I think, of value to note their occasional presence.

When acute unilateral pain immediately precedes

hemiplegia of the same side, such a sequence should lead us to reconsider the more doubtful instances in which pain and joint-lesions more remotely but more continuously antedate the palsy. I have myself no doubt that pain and many other sensations may be of cortical and cerebral origin.¹

¹ Note an interesting paper on Brain-itch, by Dr. Bremer, of St. Louis. Review of Insanity and Nervous Diseases, December, 1892.

CHAPTER IX.

THE TREATMENT OF SCIATICA.

I PROMISED that these clinical lessons should sometimes consider for you such peculiar therapeutic methods as are in use within our walls. Accordingly, I call your attention to-day to certain points in the diagnosis and treatment of sciatica.

Under this name the books include true neuralgia, without demonstrable organic changes in the nerve, and the graver pain which is due, as a rule, to some grade of neuritis.

Let us admit that the first class is seen in practice in all degrees, has a great variety of parentage, and at times many parents, or haply none that can be found.

To men like you, advanced students, clinically watchful, it is needless to say that the milder sciatic neuralgias are sometimes of malarial, gouty, rheumatic, syphilitic, anæmic, or other origin—mere functional disorders like the typical fifth-nerve neuralgia. Be this as it may, I am sure that sciatic pains, whatever be their cause, are likely to become permanent and to pass into distinct forms of organic disease of the sheaths, and, at last, into neuritis, with degenerative changes in the nerve-tissue. Too often you can detect no distinct cause, or find that you must fall back for explanation on a general lowering of tone, or on relatively slight anæmia, or something as trivial in appearance. The unusual causes, the distant reflex parentage, like the

luckily discovered decayed tooth of fifth-nerve neuralgia, are rarely called on to explain sciatica. They serve at best to keep us watchful and to make the text-books less dull reading by introducing the pleasant unexpectedness of romance.

I pause here to urge on you the fact that every human being has a different standard of resistance to the effects of anæmia, malaria, or any of the varied forms of blood-defect or mal-assimilation. What does not depress one is serious for another. Also, I ask you again to remember that frequently a neuralgia has many parents. Overwork, overworry, or a hemorrhage may cause anæmia, and out of this may come functional gastro-intestinal failures, and these in turn may occasion lithæmic disturbances, or make available for mischief the effects of exposure or accident.

Possibly, at times, old and long latent syphilis, or even gout, is answerable. Such a case meets with a fall on the buttocks, and thus acquires, owing to the constitutional poisoning of the patient, capacities to develop an obstinate neuritis. The type and severity depend upon the hygienic surroundings and the past history. An English writer declares that he has never seen causalgia such as we saw from 1861 to 1864, nor have I so seen it since, because men worn out with marching, soaked with malaria, and exhausted by exposure and diarrhœa, are not now the subjects of wounds from Minie-balls.

For the unthoughtful there is only the final accident; for the man who thinks there is link on link of the chain of preparatory states, and it were easy to illustrate them further. This is, however, to be only a lesson of hints, and I pass on.

Before considering the ordinary sciaticas I pause to say a word as to sciatic pain of which the cause is organic and lies within the pelvis. You cannot be too watchful as to this source of trouble. When you find extravagant pain down the nerve be careful how you decide. Sciatic neuritis is a very painful malady, but the pain caused by the squeeze and inflammation of rapid intra-pelvic carcinoma is a far more terrible thing, and the grade of pain may help you in your decision. In any case of doubt the rectal examination should be thorough.

Several times in my life I have seen the causal diagnosis of a furious sciatica made on the post-mortem table by the discovery of a saddle-like growth astride of the cords of the parent plexus. If the tumor be small, palpation is useless as a guide, and the best of us may be baffled. At times a large growth rewards our search. Twice I have seen accumulations of feces give rise to irritative pressure: one got well; but one, which had been treated for multiform malignant tumors, was so regarded up to death and perished miserably. The post-mortem section showed enormous fecal accumulations of such hardness as caused one of the assistants to think they were masses of calculi. In this case the pain was in the right sciatic nerve.

Benign tumors or growths of syphilitic origin may act within the pelvis to cause sciatic pain, as the following interesting case serves to show:

CASE L.—L. B., aged forty years, a planter, states that sixteen years ago he had a sore, then said to be syphilitic. He has had no secondaries of which he was ever aware, but has all his life been subject to herpetic eruptions on the glans penis. He has been, over and over, pronounced

free from specific disease. In August, 1891, he began to have vague aches in the occiput, the right knee, and the thigh. In September he had pain in and about the sciatic notch and down the leg. These aches became worse, especially below the knee, and at last almost deprived him of the power to stand or walk. At night, after twelve, his pain was so intense that morphia became essential. His case on entry here was too easily taken for granted by me as an ordinary neuritis, and subjected to the usual treatment. When this entirely failed I began to suspect that we were dealing with sciatica of an unusual type. In making the re-examination which this suspicion caused me to undertake I found at the middle of the right thigh a smooth swelling of the bone. If, as seemed likely, this was a node and specific, it became clear that it was in no way competent to cause the pain; but it was as clear that there might be within the pelvis or at the notch a similar growth, so placed as to compress and irritate the great sciatic. One week of full treatment by iodides led to rapid lessening of the external node and to a swift extinction of the pain. My inference was probably correct. After a few weeks he was dismissed cured.

It is also well to remind you that childbed may cause sciatica. I knew many years ago of one woman who always suffered during three weeks after labor with double sciatic pain, and at last, after a labor in which there was profuse flooding, was afflicted with a left-sided sciatica for many months. Some pain in these nerves you will all hear about in childbeds, and I may add that to strain at stool may cause increase of suffering to a patient tormented by sciatica, and even to rheumatic people who are without distinct neuritis.

I am quite sure that some women suffer more than do others in childbed from this effect of pressure by the

descending head. For this there may be a reason in the form of the pelve, and possibly in the mode in which the presentation occurs.

Of the terrible sciatica of alcohol I need say nothing here, and that lead or arsenic may cause sciatic neuralgia of neuritic type is also to be remembered.

Strange as it may seem, one may be misled for a time as to diagnosis by a subacute inflammation of the hip-joint, with aches about the knee, slight wasting, and stiffness. As between this and the sciatic pain which exists chiefly in and around the foramen of exit and has caused nutritive changes in the gluteal muscles, one is at times troubled to decide. At all events, I have seen surgeon and physician err one way or another as to these maladies.

And now as to one or two matters connected with sciatic pain, before we consider the treatment of sciatic neuritis and the neuralgias likely, under conditions adverse to recovery, to eventuate in the more serious malady. I shall presume upon your full knowledge of the symptoms of sciatica. The gait, the wasting, the pain-points, and the hyperæsthesia or anæsthesia I may pass over as familiar. But look now at the case I show you from McCormick ward. When this man entered here he had violent pain at the sciatic notch on carrying the leg forward. A case near by, now well, had pain down the leg on putting the leg far back, and at each step as the leg on which he stood reached its extreme limit of backward position. The forward swing eased him. A case seen last year fell as if shot when he stood on the lame leg, the pain darting down the limb from the notch. A few years ago I saw a still worse example of this form of pain. In this latter

case, after long treatment, I found that very deep pressure at or over the notch caused acute pain. Finally, we cut down (I think it was Dr. Morton who operated) and found a small, round, hard, fibrous growth just over the point of exit of the nerve. Its removal brought about a speedy recovery. Extreme lift of the leg in sciatica nearly always gives increase of pain, and some sciatica patients who have suffered long carefully limit the length of their step so as not to make any pull on the nerve.

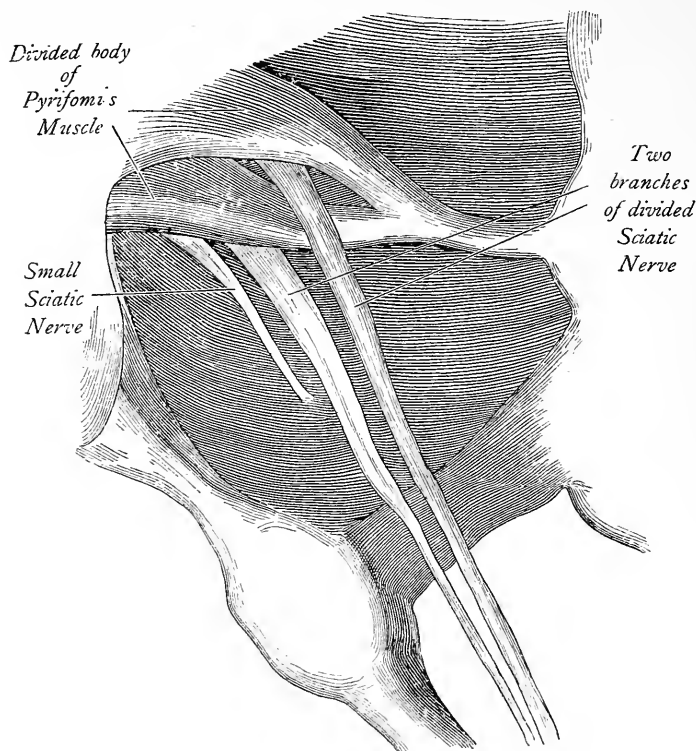
Walking exercise usually makes the pain of sciatic neuritis worse. The cause is, perhaps, not so simple as it may seem to you. Of course, it is natural to presume—is, I think, generally taken for granted—that the rhythmic tension of the muscles at the notch squeezes a swollen nerve as we walk or stand, and thus increases the suffering.

I have taken some pains to see how far this may be true. The result of a brief study of dissections made for me by Dr. Addinell Hewson, that I might investigate the matter, proved of interest, especially as the anatomies did not make it entirely clear.

The great sciatic emerges from its foramen with ample space around it. Then it lies in an irregular triangular gutter between the tuber ischii and the great and lesser trochanters. This space is over-large and narrows or widens as inversion or eversion of the foot and leg turns the head of the bone inward or outward. Above, or posteriorly, this deep gutter is covered by the gluteus maximus. At the lower edge of this muscle the deep fascia turns under it and then is reflected downward, so as to roof over the lower part of the sciatic gutter with a dense covering, which is attached to the ischial tuber-

osity, and to a part of the lesser trochanter. This fascia thus forms a strong tentorium, protecting the nerve more or less from external violence. The pyri-form muscle, which overlies the nerve, is so situated that it crosses where the nerve, lying rather free in its

FIG. 2.



Anomalous high division of great sciatic nerve, one branch passing through pyramidalis muscle.

notch, could, even if swollen, with difficulty suffer from the action of this muscle. In front of the nerve lie the quadratus and gemelli and the tendon of the obturator. When these muscles swell in such contractile effort as everts the foot they may more or less press upon the nerve, but the consentaneous action of the

tightening mass of the gluteus must tend to enlarge the cavity in front of it and make tense its roof, so that unless immense swelling of the nerve be present or a growth, the activity of these muscles could scarcely cause pinching or pressure of moment.

Dr. J. M. Taylor called my attention to the fact that in 1600 sciatic nerves there were 49 anomalies of a nature to cause quite surely pain in a swollen nerve when the pyriformis acts. In these anomalies the nerve divides so that one part goes through the belly of the muscle—as is well seen in Dr. Taylor's sketch. As a fact, eversion or inversion of the foot rarely gives rise to increase of sciatic ache. We must look elsewhere for explanations. It seems to me probable that the forward swing of the leg in walking may be felt because at its full limit it must repeatedly stretch the nerve a little, and very little is needed to hurt an inflamed nerve. Thus, going up stairs, which stretches the nerve far more, is painful. Also, we should remember that the thigh-muscles, bound down by tense fascia, may in action somewhat compress the track of the nerve.

Whether any of the exceptional cases of violent anguish referred to the notch on standing are due or not to the anomalous peculiarity mentioned I cannot say.

Very rarely, it is the backward motion which causes pain, and for this I can see no competent explanation.

I suspect that very often the pain increased or reproduced by walking is due to more mysterious causes, which are of central origin and analogous to such as are present in facial neuralgias when the patient chews or swallows, talks or laughs. Then there seems to arise a

sudden reinforcement of capacity to feel pain on the part of the nerve-centres. It is also quite sure that certain sciatic cases are eased by exertion; probably these are not cases of neuritis.

I wish to say a few words as to the time of the exacerbations of pain in sciatica. I have studied with some care the hour of greatest pain in neuralgias, and I think I may be secure in stating that for fifth-nerve neuralgias it is likely to be before noon, and for sciatica after 4 P.M. In many cases of the latter malady it is between 12 at night and 4 A.M.; these figures are the result of an examination of something like a hundred neuralgias.

Whilst this holds good for our own climate, it may be quite untrue elsewhere, as in the South or in England. I mention this because abroad the remarkable statistics of my clinics, and the studies of Dr. Morris Lewis and of the author on chorea in relation to seasons, have been doubted, or declared not to have been confirmed by European observers. It would be odd enough if they were, as almost inevitably the relation of pain or other morbid phenomenon to time of day or year may differ in one continent from another. It is the comparative results which become interesting.

As regards this question of the time of pain-occurrence there are valuable papers by myself¹ and by Captain Catlin,² U. S. A., which exhibit, as concerns a remarkable case of traumatic neuralgia, a curious

¹ Relation of Pains to Weather, by S. Weir Mitchell, M.D. American Journal of the Medical Sciences, April, 1877.

² Relations of Pain to Weather, Studied during Eleven Years of a Case of Traumatic Neuralgia, by Captain R. A. Catlin, U. S. A., with Notes by S. Weir Mitchell. Transactions of the College of Physicians, Philadelphia, 1883.

Memoirs of the National Academy of Sciences, 1892. Final report by Captain Catlin.

tendency to the increase of pain at set periods of the day.

Sciatic pain tends to be worse at night. The treatment should, so to speak, follow it into this period; and this is why I have insisted here on the time-question.

And now let us pass on to the treatment. If you turn to the text-books, as to this and other well-studied diseases, you will find a bewildering list of drugs, and mechanical and other treatment mentioned, with the constant introduction of "So-and-so has been or may be used;" also, "G recommends this, K that, in this disorder." Dropping all this puzzling list of drugs, and what not, I shall now tell you what I usually do here, and do *in succession* in these cases, as improvement or failure makes desirable. In private practice you cannot always do at once as you wish to do, or think really best. Except as to that which money brings—change of climate and the like—so far as mere immediate treatment is concerned—the poor, in a hospital like this, have sometimes a better chance than the rich or highly placed, as certain illustrious precedents have proved.

If in the text-books the list of drugs and counter-irritants were followed by a clear statement of what the author advised in mild or in grave cases, these books would acquire a definite and individualized value. One may read all that Gowers, or Gray, or Dana says, and, if young in practice, rise without the least distinct idea as to just how these able men treat their own cases of sciatica. You may rest assured that they are more definite in their practice than might be inferred from their books. The treatises on mere therapeutics are yet

worse. In one is a list of forty agents which may be used in sciatica.

Let us say that we have to deal with a mild case, a first attack. The usual careful search through the organs and secretions has been made. Any obvious constitutional disorder is provided for. What next? As to this, all are at one—rest in bed, constant and prolonged, till recovery is assured. Few things are as valuable as dry cups, if you use them thoroughly and early. Very effective is a double or even a triple row of cups all around and over the notch and down the leg, along the nerve-branches to the ankle. There should be some three dozen cups simultaneously applied, and they should remain on half an hour, but not be used so as to blister. This measure is repeated the next day; then two days later, and this alone may answer. Or, if for any reason you cannot do this, put on mustard, at least three inches wide, from notch to ankle; or, at least, to the knee. Add a little molasses to the mustard, and you may then leave it on for hours; and this, too, may answer. Some of the elder doctors, like Pearson, knew the fact that very extensive moderate counter-irritation is often better than limited and more severe attacks on the skin by irritants.

If these means fail, what is to be done next? As to this I hesitate no longer, but go on at once to the means I now employ in chronic cases. But, at the beginning, and perhaps later, until you can permanently ease the ache, it is needful sometimes to use narcotics. Cocaine is the best, in from one-fourth to one-half grain hypodermatic injections. How rarely we use narcotics here, even in our worst cases of sciatica, the resident physicians very well know. If you

prefer morphia, give one dose at about 8 or 9 P.M., and get rid of it soon.

But suppose the disease prove intractable? Let us take the case in which mild irritants, rest in bed, and constitutional means have failed; or that of the old hospital guest who has carried pain with him from ward to ward this year or two.

Consider a moment the attitude and ways of a really severe case of neuritis, and let us see what guides these obviously offer. The man lies in bed with the leg slightly bent at the knee and hip. If he wishes to turn, he keeps the limb rigid—splints it, let us say, by the use of his muscles, aids it with the stay of supporting hands. In the exacerbations, in the anguish of the night's increase of pain, a touch, even slight friction of the bedclothes, increases the distress. It was while watching such cases that it occurred to me to use a splint to keep the limb quiet. If I could by this means forbid the use of muscles, I should thus far secure to the nerve physiological rest, which, for many reasons, seemed desirable. If *free* motion gave pain, *all* motion might be relatively hostile to recovery. At a much later date I was struck with the familiar fact that all contacts were avoided in certain cases and that any sudden touch, even that of the bedclothes, was able to increase the pain. It seemed to me, as I considered the matter, that such unequal, irregular contacts might be hurtful, and that by a bandage I could secure the surfaces from these, and thus still further insure to the nerve functional repose. Finally, it was possible that the bandage might, by gentle, firm, general pressure, lessen the amount of blood circulating in the leg, and thus relieve, just as one eases an aching finger by firmly

grasping it. My success seems to be a justification of the reasoning; but that is of little moment. There is much good treatment which we cannot explain.

There are many ways of doing these two things. But whether you suspend the leg in a splint, or use wire or moulded splints, the splint must check motion at the hip and knee. This is the essential matter. The bandage must be of thin, pure flannel, and reach from foot to groin. I have used rubber or elastic stockings, and also combined use of the splint with pressure by plaster or other splint dressings. Practically here we use for all true sciaticas a firm flannel bandage from foot to groin and reapply it twice a day. The leg is slightly bent at the knee and kept nearly straight at the thigh, and in this position secured to a light side-splint from axilla to ankle by a few turns of a bandage. Care is, of course, taken to prevent pressure on the heel. After a few days the joint-angles are slightly changed at each dressing. Still later, as the pain fades, the joints are mildly and passively exercised whenever the bandages are renewed. Usually three weeks must pass before we can begin to abandon treatment; a much longer time may be needed for old cases. Finally, we take off the splint *in the day*, but leave the bandage on. At night we replace the splint. Later we give up the splint, and, with the presence or absence of pain as our sole guide, in like manner we omit the bandage, now in the day, and finally at night, but not at all until the patient has begun to move about, and perhaps not then.

Meanwhile with cod-liver oil, iron at need, good diet, care as to the bowels, never allowing a costive passage, forbidding effort at stool (preventing it by hot enemas)

—by these means, I repeat, we carry the man through. When the pain has quite gone we use mild massage once a day before replacing the bandages. The process must be careful, with avoidance of roughness.

There may be left, near the close of this treatment, one or more points of persistent pain, not often severe. These are best treated by counter-irritants, the best being the light touch of a white-hot Paquelin button, or a small blister.

The getting up of a severe sciatic case is not unimportant. Motion, the full use of the leg and buttock muscles, and the pressure of the hard edge of a chair, or close stool, are likely to bring back pain. Hence, *we do not allow a man to sit at all the first week* that he is up. He must at first stand, and then walk, but always, whether he walk or stand, it must be with the aid of crutches. He may be upright, or lying on a bed, but not seated. Electricity is rarely needed, even if there has been much wasting. With exercise and massage, or without the latter, the muscles usually get strong.

I have said no word of the use of continuous cold so much employed here before the bandage and splint combined were found to triumph readily over most cases. It is still occasionally employed. The method I have elsewhere detailed at length in the International Lecture Series. It gives us a resource of great value if the less troublesome plan should happen to fail; and failure is rare unless the neuritis has gone up the nerve into the sacral plexus, or unless the pain is really spinal in its origin. My former published cases involved the combined use of ice and splint-rest. Those I have shown you of late were treated chiefly with the

tight bandage and long splint, to which you may add ice-bags at need. The rapid gain to be had in an old case of sciatic pain out of these means—the flannel bandage, splint-rest, and ice—must be seen to be fitly appreciated, and I may add that in mild cases the tight bandage used alone is often of value. I do not claim for these simple means any such certainty as seems usually to be demanded from novel methods. I find, however, that I rarely fail, and that my colleagues, like myself, are using these means. It is with me an old treatment, for in 1872, in my book on Nerve Injuries, p. 72, I used these words:

“When the disease is really subacute and the nerve tender on pressure for some considerable part of its length, I insist upon the most absolute rest. If it be the leg which is attacked, the patient must go to bed and consent to wear a carved splint for several weeks. If it be the arm, a splint answers to put it in a state of repose, and without this it is vain to employ other means.

“Cold should be used over the nerve-track by means of Chapman’s spine-bag, or, better, by such as are now made by the Davidson Rubber Company, which are thinner than those of English make. The caoutchouc bag should be inclosed in a case of thin flannel, and may then be kept *in situ* by a splint and a bandage, if a splint be worn. In most instances I have used them over nearly the whole length of the main nerve, and have usually contented myself with their employment in the daytime. In some cases, however, I have had them renewed twice in the night, and this plan I believe to be the better of the two. The only difficulty lies in the first pain from cold, and is easily overcome. The relief afforded is often remarkable, and the loss of the nerve in size, hardness, and tenderness most gratifying.”

The following briefly stated cases, for which I am indebted to Dr. J. M. Taylor, sufficiently illustrate my practice. Many more might have been added.

CASE LI.—J. M., aged thirty-six years, born in Ireland, a carpenter, as a boy had some kind of bone-disease involving the left tibia, with a purulent discharge. Eight years ago he fell forty feet, hurting his left hip. He drinks rather freely of whiskey, smokes excessively, and denies venereal disease. There was no neuralgia in the leg until three years since, when it began with a dull pain in the region of the sciatic notch, and passed along the outer aspect of the thigh to the knee. The pain is now confined to the course of the left sciatic nerve; it is constant and worse at night; it is increased in the act of sitting down, and on rising from this position there is much less pain.

Examination of the various organs proved negative. A scar was found on the left leg, at the junction of the upper and middle thirds of the tibia; there is another a little posteriorly to this, and a third lower down; these resulted from old sores, which finally healed ten years ago. The pupils react to accommodation and light; knee-jerks and elbow-jerks, and plantar reflexes, etc., are normal.

The measurements of the thigh, nine inches above patella, were: R., 21 in.; L., 18 in.

The thigh, six inches above the patella, measured: R., 18½ in.; L., 16 in. The calf: R., 13 in.; L., 13½ in.

He responded normally everywhere as to touch, tested with the æsthesiometer; localization was good; urine analysis was negative.

The patient was admitted to the hospital February 18, 1892, in a state of extreme suffering.

The treatment ordered was absolute rest, good diet, milk between meals, iron and quinine, flannel bandage, and massage. He managed, with phenacetin, to do without

opiates, and on the fourth day of treatment he ceased to feel acute pain.

On March 3d no pain was complained of and the splint was removed; the limb was kept straight.

On March 14th the weight of the body cautiously put upon the left leg was followed by no pain.

On March 30th the man was well able to move freely without pain; no cautery or treatment other than the bandage and splint was needed, massage having been abandoned early. He had a slight relapse on the 16th, owing to his having risen, incautiously and without a crutch, to assist a patient who had fallen.

This was a clear case of sciatic neuritis, with much wasting. Seen after many months he was still free from pain.

CASE LII. *Double Sciatica*.—K. P., a porter, aged fifty-seven years, a German; married, has seven children; was never ill until December, 1891, when he had what he describes as a bilious attack, which kept him abed three weeks. He broke two ribs three years ago. There was no evidence of syphilis. In October, 1891, he had a rheumatic swelling of the right ankle. A little later the pain extended up the line of the posterior tibial nerve, and generally along that of the main trunk. It was worse upon exertion, and was eased by recumbency. Nevertheless, he went on with his rather heavy work until, after exposure to wet, the pain became far worse and the knee somewhat stiff. At times he could no longer walk, and had also aches in the back and in the left leg.

In August he had severe cramps in both legs and limped increasingly. Still, under dire pressure of need, he continued to work. Late in August he had solar exhaustion, and at the Pennsylvania Hospital was treated by ice-rubbing. This, he thinks, chilled him severely.

The next day intense pain arose in the left leg, grew worse, and he became able to work only intermittently. The pain now (October 14th), on admission, is very severe over the right sciatic and in the thigh and the calf of the right leg. There is, also, pain on pressure, but none in the sciatic notch or in the popliteal space. In the left leg pain is very marked on pressure along the entire course of the sciatic. There is no pain in the back.

Measurements. Thigh: R., 18 in.; L., 16 in. Calf: R., 13½ in.; L., 13 in. Dynamometer: R. hand, 125; L. hand, 125.

The knee-jerks on both sides are normal, and there is no clonus; the elbow-jerks on both sides are normal, and there is no impairment of muscle-jerks; sensation is everywhere good; the heart, lungs, kidneys, etc., are normal. To stand long occasioned pain in both legs, especially in the thighs; walking is difficult and painful. In November, 1892, on taking charge, I found this man in bed, having had elsewhere many forms of treatment, all unsuccessful. He was ordered full diet, rest in bed, with flannel bandages to both legs. On the third day he became nearly free from pain. Thereafter the usual changes as to splint and bandage were made. It seems needless to repeat them.

On December 2d he was allowed to walk a little on crutches, but not to sit down. Two pain-points in the upper thigh were lightly cauterized. He was discharged December 12, 1892, apparently well.

This appears to have been a case of true double sciatica, probably rheumatic. I learn that he is now (April 1st) well and at work. The immediate effects of the splint and bandage were very gratifying.

CASE LIIII.—G. C., aged sixty-five years, is a machinist; he drinks and smokes moderately; is very rarely ill. During the war he had "camp fever." He denies venereal

history. He is married; has had nine children, five are living and four dead. Suddenly, six weeks ago, pain began in the left hip and leg; the left foot feels asleep quite constantly; the pain grows worse at night, on change of weather, on rising from a chair, and while walking or going up steps.

The man is pale and thin and has the gait of one in much pain; the left leg is held stiffly. The left knee-jerk is slightly in excess of the right. Pressure over the left sciatic notch causes pain, and also along the course of the nerve. He was admitted to the hospital March 5, 1892, and was ordered absolute rest in bed, flannel bandages, straight splint, extra diet, milk, iron, and cod-liver oil. On March 10th the report says that the pain disappears in the daytime, but at night is sufficiently severe to keep him awake. On March 13th all pain has disappeared, except a soreness over the external condyle of the femur and external malleolus where it is in contact with the splint. He now sleeps well. On March 18th all pain is lost, even upon deep pressure. On March 21st the splint is removed in the daytime, but the limb is to be kept in extension and quiet. The splint was applied at night until the 26th inst. The bandage was constantly used, and he walked with crutches. He has had slight relapses, necessitating the use of the splint for a day or two. On March 28, 1893, he was discharged well—a rapid recovery.

CASE LIV.—P. G., aged fifty years, had the interesting combination of sciatica and erythromelalgia. The family history was negative. He was a married man with six children, all well. In the army he had a severe attack of measles followed by dysentery, and later typhoid fever; he was ill five months. After the war he had malarial fever. Seven years after the first attack of dysentery he had a second attack which lasted five years,

during which time he passed much blood and mucus ; most of this time he continued at work and often voided twelve stools daily. During the last five years the man had been pretty well. He had never had any special injury, but has not been very strong since the last attack of dysentery. He worked as a lumberman for five years, being out in all weathers. In January, 1889, he began to work in the coal-mines. Since his army-life he has had some fleeting rheumatic pains now and again. The present trouble began January, 1889, while at work in a mine, with severe shooting-pain in the right arm and shoulder, noticed while at rest, but disappearing on motion. This lasted three weeks. He sleeps habitually on the right side and had need to keep the arm flexed. One month after this, pain began in the left hip, shooting down the course of the sciatic to the calf and ankle, and being of greatest intensity from the knee to the ankle. He was then confined to bed four weeks ; on the slightest movement the pain was much increased ; this gradually lessened, but the man was unable to work for five months. He describes the pain, when it began, as a burning and crawling sensation in the right leg, as if the flesh was on fire ; this continued in both feet in very severe degree ; he could place his right foot on the floor, but not the left one, on account of excessive pain. After two months' treatment he had improved, but was unable to work for five months. He was pretty well until January, 1892, at which time pain of similar kind, but more severe, attacked the back and left hip, seeming to warp the body to the left side. Much pain was caused by any attempt to straighten the body, shooting down the left leg into the foot and toes. He was again confined to bed for four months. He was in the Jefferson Hospital in May, 1892, for five weeks. He finally was well enough to go home, but could not walk, and on arriving the pain grew worse. Since May, while

standing with the left leg pendant, the blood seemed to accumulate in the foot and leg up to the knee and cause intense pain.

October 14, 1892. The left leg is noticeably shrunken and flabby; there is considerable pain on pressure over the sciatic notch, with soreness over the calf-muscles, but none in the popliteal space; there is no shortening of the limb. The foot is red and hot when hanging down.

Measurements. Thigh: R., 17 in.; L., 15 in. Calf: R., $12\frac{1}{2}$ in.; L., 11 in.

There is slight clonus in the left leg, but none in the right; the knee-jerks on both sides are normal; the plantar and skin reflexes are normal; there is slight hyperæsthesia in the left leg below the knee; the heart, lungs, etc., are normal; the bowels are inclined to be loose and irregular; the appetite is fair; the digestion poor.

This man, while in the standing position, declares himself unable to allow his heel to touch the ground, asserting that it would pain so increasingly and furiously as to "drive him wild." There is also pain on pressure over the entire sole of the foot; pressure caused an intense flushing of the surface.

The treatment ordered was absolute rest, flannel bandages, the straight splint; massage, except to the left leg; cod-liver oil, malt, extra food, iron, quinine, and strychnine.

On October 26th the pain was so intense that ice was applied. On December 2d, the vaso-motor difficulty not lessening satisfactorily, the left leg and foot were elevated. Internally, sodium phosphate was ordered, forty grains in hot water, an hour before meals, to relieve the constant catarrhal condition of the stomach.

On December 19th the man was very much improved in respect to the sciatic pain; he gained in weight and vigor, and he was allowed to go home on the 20th, as he declined to remain longer. He still wore the flannel bandage and

used crutches. The flushing of the foot was not better; the hyperæsthesia of the member was little altered.

As usual in my sad experience of erythromelalgia, nothing did much good for the foot, although heat, cold, electricity, and massage were used with care, and I give the case as it left us, because of the great gain in the sciatic pain, which, if not well, was vastly bettered by local rest and bandage. The long elevation of the leg and foot seemed to make the nerve-tracks more tender, a result which I have seen before and since, nor did it help the vaso-motor complications. I presume this man to have a quite distinct case of erythromelalgia, with sciatic and terminal neuritis.

You may with reason ask what I do if the treatment by the splint-rest and bandage, or by splint-rest and ice, fail. At first, to clear my experimental therapeutics from needless doubt, I used these means only in cases which I was sure were sciatic neuritis, and this alone. I have elsewhere recorded the results.¹ Of late, and since I felt secure as to my process. I and others have used these means in cases of more dubious nature—in double leg-pain, in those who had certainly troubles in the lower cord. In such examples of sciatic pain of central origin there have been many failures to record—many cases in which splint-rest did no good, or little. In the true sciatic cases which finally defy all medical means there remains for consideration nerve-stretching. I have seen it fail when my own milder means succeeded. I believe that when surgical nerve-stretching is employed we should at once follow up its use by that of the roller and splint-rest. Some

¹ International Lecture Series.

of the relapses which follow its successful use have, I am sure, been due to neglect of the precautions with which in every case of neuritis I desire to surround my patient. In conclusion, I desire to add that I do not look upon splint-rest and the bandage as certain to cure all sciaticas, but as sure to relieve or cure most cases, and as valuable adjuncts to whatever other means becomes desirable.

CHAPTER X.

ERYTHROMELALGIA: RED NEURALGIA OF THE EXTREMITIES; VASO-MOTOR PARALYSIS OF THE EXTREMITIES; TERMINAL NEURITIS.

I THINK myself fortunate in being able to show you this morning the two cases now before us. One is a typical example of vasal spasm in the arterioles of the fingers, and is known as Raynaud's disease. The other is the remarkable malady which I first described in 1872, and to which in 1878, at Professor Ashhurst's suggestion, I gave the name of *erythromelalgia* (redness, extremity, pain); "red neuralgia" some like to call it. It is inconceivable that these two disorders should ever have been confused, and yet at least one able observer speaks of erythromelalgia, dead fingers, local asphyxia, local syncope, symmetrical gangrene, as all being simply different types of Raynaud's disease. I hardly imagine anything clinically more strange than to consider the cases before us as one. Examples of Raynaud's malady are not rare; cases of erythromelalgia are very uncommon.

Here before you are two people. One is a pale, nervous, excitable woman, whose condensed history my clinical aid will presently read. We shall somewhat abbreviate, for the whole matter has become familiar, and, except as to the mechanism of causation¹ concerning the clinical features, we know all that we are likely

¹ Medical Record, N. Y., July, 1885.

soon to know. I show the case now only as a contrasted clinical picture.

CASE LV.—C. L., single, aged thirty years, a dress-maker, is an intelligent woman. She has had no grave illness, but after a long strain and much work she began to have the well-known corpse-fingers. These attacks became severe and more lasting, and by and by passed at times into the condition of local asphyxia, the fingers becoming livid in tint. Later, she had slight gangrenous loss of all the finger-tips. You see the scars on the finger-tips, now white and cold. This state may come and go, or may end in the livid condition, when the returning blood stays in the part and becomes black.

Observe now that when I prick the livid finger the blood flows out black, and does not redden by exposure. It is clear that it is locally charged with excess of carbon dioxide, but has no other peculiarities. Many of Raynaud's cases suffered much pain. This woman, like others I have seen, has had but little.

CASE LVI.—Turn now to this man in the rolling-chair. Thin, ruddy, anxious-looking, he is in no wise hysterical, and is both patient and intelligent. His face bears the signal-lines of pain. Look at his foot, as it lies on the extended leaf of the chair. There is nothing notable about it except the scars of an old injury. It is like the other foot—neither red nor pale. He says it aches continuously—a dull, deep-burning ache. Also, as you see, it is tender to deep pressure and less so to lighter pressure, except as to the outside and as to the heel and fourth and fifth toes. I ask him to rise. He does this aided. He positively will not stand on the foot. He leans now on a chair. Almost at once three of the toes become of a bright, rosy tint; then, beginning in island-like spaces, a deeper tint covers a large part of the foot. The arteries throb. The veins stand out in strong relief. In a few minutes the vascular

tumult lessens. The arteries cease to throb. The redness becomes dusky or in places purplish—not livid, as in the woman's case. At once the dependency of the foot brings increase of pain, and this gets worse until he will stand no longer or falls fainting.

In like degree the hyperæsthesia, both of depth and surface, is augmented. Finally, the touch of a feather gives pain, and deeper pressure sends darts of pain up the track of the posterior tibial nerve. At last the pain is unendurable and I must let him put the foot up again on a chair.

It is interesting to observe how unstable everywhere is his surface-circulation; how flushes come and go over the legs and trunk, and how little the other foot changes color.

Surely, no two more entirely separate groups of symptoms could be found: this cold, white hand, with its pale fingers, free from pain of any moment and more or less anæsthetic, and now presently livid; this hot, deep-red foot, so painful that its torment brings out the sweat on the sufferer's brow.

Before dismissing these cases, I desire to say a few words as to the contrasts they offer.

Lannois, whose book I mentioned, thus characterizes local asphyxia, or symmetrical gangrene, and erythromelalgia. I have somewhat altered his definitions:

Local asphyxia (Raynaud).

Sex: Four-fifths females.

Begins with ischæmia.

The affected parts become bloodless and white. In certain cases there is the deep, dusky congestion of a cyanosed part, with or without gangrene.

Erythromelalgia (Weir Mitchell).

In twenty-seven cases two were women.

Little or no difference of color is seen until the foot hangs down in upright posture, when it becomes rose-red.

The arteries throb, and the color becomes dusky-red or violaceous in tint.

Local asphyxia (Raynaud).

Pain may be absent or acute, and comes and goes; has no relation to position. May precede local asphyxia.

Unaffected by seasons. In many cases all the symptoms can be brought on by cold.

Anæsthesia to touch.

Analgesia.

Temperature much lowered and unaltered by posture.

Gangrene local and limited; likely to be symmetrical.

Erythromelalgia (Weir Mitchell).

Pain usually present; worse when the part hangs down or is pressed upon. In bad cases, more or less at all times.

Worse in summer and from heat. Eased by cold.

Sensation of all kinds preserved.

Hyperalgesia.

Temperature greatly above normal. Dependency causes in some cases increase of heat; in others lowering of temperature.

No gangrene; asymmetrical.

Erythromelalgia, then, is a chronic disease in which a part or parts—usually one or more extremities—suffer with pain, flushing, and local fever, made far worse if the parts hang down. There are mild cases which do not progress, and which may come and go. There are others which exhibit all the symptoms to such a degree as to make the disease one of terrible torment.

In 1878, when my second paper was published, I predicted that the malady would soon be shown to be more common than it appeared then to be—and this has proved to be the case. Lannois's treatise¹ gives many cases, and of late the German observers have delineated it with their usual care, and especially Gerhardt. At the time I wrote I should, if driven to be positive in statement, have inclined toward considering this malady as due to some form of spinal disorder. And this may yet prove more or less true of some of the cases, or of some stage of the cases. But at present the reasonable explanations incline rather toward some form of

¹ Erythromelalgia, 1880, p. 71.

that new clinical perplexity, peripheral neuritis. Light is cast on the matter by the later history I have just obtained of the case of Mr. K., whom I saw in 1876, and whose story it seems worth while to give here at length, before returning to the discussion of causes. Here is a brief *résumé* from my paper of 1878:

CASE LVII.—G. K., single, clerk, lost his right arm in war, 1862. Army-life was too exacting for his strength, and in 1864 an attack of typhoid left him with impaired vision—relieved in 1872 by glasses. Between these latter dates the foot-trouble began, with burning pain and redness, made much worse by exercise. He persisted in walking until he caused blisters, and these were the only nutrition-changes I have ever seen in this disease. In 1875, with some evidences of paresis in leg and arm, the remaining hand became red, tender, and painful. The case was typical. In July, 1877, after extremities of anguish, Mr. K. went to Elmira, where Dr. Morris Lewis saw him for me and made notes. There was little change as to the disease; but he had become silent and morose, and was unable to be out of bed. From November to July of 1877 he had nine attacks of convulsions, or rather of general rigidity. He spoke slowly and in whispers. Clearly he had become more or less hysterical.

There was slight œdema from the waist down. Pressure on the spine caused pain, and the extremities were very tender everywhere. The finger-ends were bluish and cold. The last two phalanges were smooth, red, and shiny, reminding one of certain cases of traumatic neuritis. There was great pain in the feet, the worse for heat and dependency. Also, he complained of girdle-pain at the waist. Sensation in all forms was normal as to motion; a fine tremor existed throughout upon effort. There was very quick exhaustion, but no other distinct loss of power.

Temperature and electric tests were difficult and objected to. Faradic reaction in the arm-muscles was normal. The same current in the leg-muscles caused no motion; a stronger current caused general convulsive movement of the limb. There was no other obvious change.¹

To my surprise, I learned of late that this unfortunate gentleman was still alive. One of our staff, Dr. Burr, has visited him at my desire, and this is the present history, after at least twenty-three years of varied suffering:

“The patient’s condition remained the same from the time Dr. Mitchell last saw him until 1883, during which year the redness in the feet slowly disappeared and the pain grew less severe and finally became a mere ache. There has never since been a return of the color. For some years the legs and abdomen have felt numb, or, as he expresses it, he is ‘dead from the belly down.’ He has never had a bed sore. He has lost flesh during the last part of five years, but at times increases a little in weight. He lies on the right side or back, with the eyes covered by two bandages. Lying on the left side causes pain in the left shoulder. The room is kept darkened. He has not read for many years; not because vision is bad, but because doing so causes occipital ache and nervous feelings in the head. The voice is whispering, and so low that he is heard with difficulty. There is remarkable emaciation, the abdominal wall almost falling against the spine. The skin is very pale, but the mucous membranes are of fairly good color.

“As he lies in bed the feet fall forward in lax extension. He can flex and extend the toes, ankles, and knees, and adduct and abduct the thighs while the legs are sup-

¹ See American Journal of the Medical Sciences, July, 1878, for full report.

ported by the mattress, but he cannot raise the legs from the bed. He can move the left arm weakly in all directions, but has not strength enough to grasp anything. He cannot feed himself. There is no more wasting of the legs than of the rest of the body. Position does not now influence the color of the extremities. There is no œdema of the feet. The skin-temperature is good to the touch. There is no rigidity at the ankle-joint, knee-joint, or thigh-joint, passive motion being perfectly free. No trophic joint-lesion is present. As to sensation, he localizes touch in the legs and the arm perfectly. Contact is often felt as pain, more so in the legs than in the arm. There is no more pain on pressure over a nerve than over a muscle. There is no discoverable swelling of the nerve-trunks.

“The reflexes in the legs are all increased. A slight touch on the soles, and at times, indeed, on any part of the legs, will cause the member to be quickly and forcibly drawn up, and sometimes the movement may extend to the other leg. The knee-jerk is quick, large, and spastic. Clonus is present in both feet, and at times patellar clonus can be produced. The left elbow-jerk is present, but not very marked. The muscle-jerks are capricious. Chin-jerk cannot be obtained.

“The bowels are moved once in eight or ten days, always by strong purgative medicine or mechanically. He never has a voluntary stool. He cannot hold water after the desire to micturate comes on, but the stream is good and there is never dribbling. Sexual desire and power are abolished. Examination of the abdominal and thoracic organs is negative. Sleep is variable and often restless. Violent jerking of the legs is frequent during slumber. He now has no violent pain in the feet, but at times much severe aching. He can foretell a storm by increase in foot-pain and shoulder-ache. He complains much of queer, indescribable feelings in the head.

“There is no difficulty in swallowing. Appetite is variable. Mental condition is good, but all mental effort is disliked. I believe that at the present time an hysterical element is added to his organic disease. His manner, voice, and head-symptoms point in this direction.”

On April 13, 1893, this patient died in Washington, and to my regret no cadaveric section was allowed.

Seen in the wisdom-yielding light of many years this case seems to have been originally a neuritis of peculiar type, resulting, as time went on, in the addition of hysteria and of lasting spinal lesions to be discerned in the clear language of spastic conditions, excitable reflexes, clonus, and girdle-pains. Neither hysteria nor the added spinal malady may be essential features of the disease. I have seen them in other cases, not always with the same manifestations as here. And, on the other hand, I know of erythromelalgias of milder type, which, after twenty-five years, have altered little, and certainly have not become worse or added a single spinal symptom. The old age of a case may really be of more analytic value than a cadaveric section. In K. the neuritis clearly ceased to be a very active agency. The sequent spinal malady, probably at one time itself a central and limited neuritis, remains, and, too, the hysteria is visible enough. And now let us turn anew to the present case. Mr. K.'s case, as I read it to-day, might have been better studied in 1876. I did not realize its importance. I lay before you Dr. Rhein's notes of the present case, taken in my ward. Dr. Burr has also given it his careful attention. It is so pure a type of erythromelalgia that I consider it most desirable to study it with extreme minuteness.

CASE LVIII.—T. S., aged twenty-one years, a stone-cutter, applied for treatment at Dr. Goodman's clinic in February, 1893, on account of pain in the right foot and difficulty in moving it. Dr. Goodman, promptly recognizing the neurotic element in the case, kindly transferred the patient to my care. The family and personal history is negative.

In February, 1892, the patient, with several other men, was raising a stone weighing between ten and eleven hundredweight, when the board supporting it broke and one end of the stone fell three feet and struck the patient's right foot just in front of the ankle-joint. In a few moments the stone was removed. The patient was unconscious for a little while. After about an hour he again became unconscious and remained so for four hours. The wound was superficial and bled very little. The foot and leg, half-way to the knee, swelled considerably. The patient was kept at rest for four days and hot water was applied to the leg. Six weeks later a large swelling upon the sole was incised for the relief of a supposed abscess. Little bleeding followed, and there was no evidence of supuration. Ever since the injury there has been difficulty as to motion in the ankle, owing to pain. He began to walk December 24, 1892. The swelling did not disappear entirely until two months after the accident. Walking caused sharp pain under the internal malleolus and just in front of the ankle-joint. In damp weather there was pain in the right great toe. The right foot felt warmer to the patient than the left. The effort to walk was soon given up and the horizontal position permanently assumed as the only one possible to be borne.

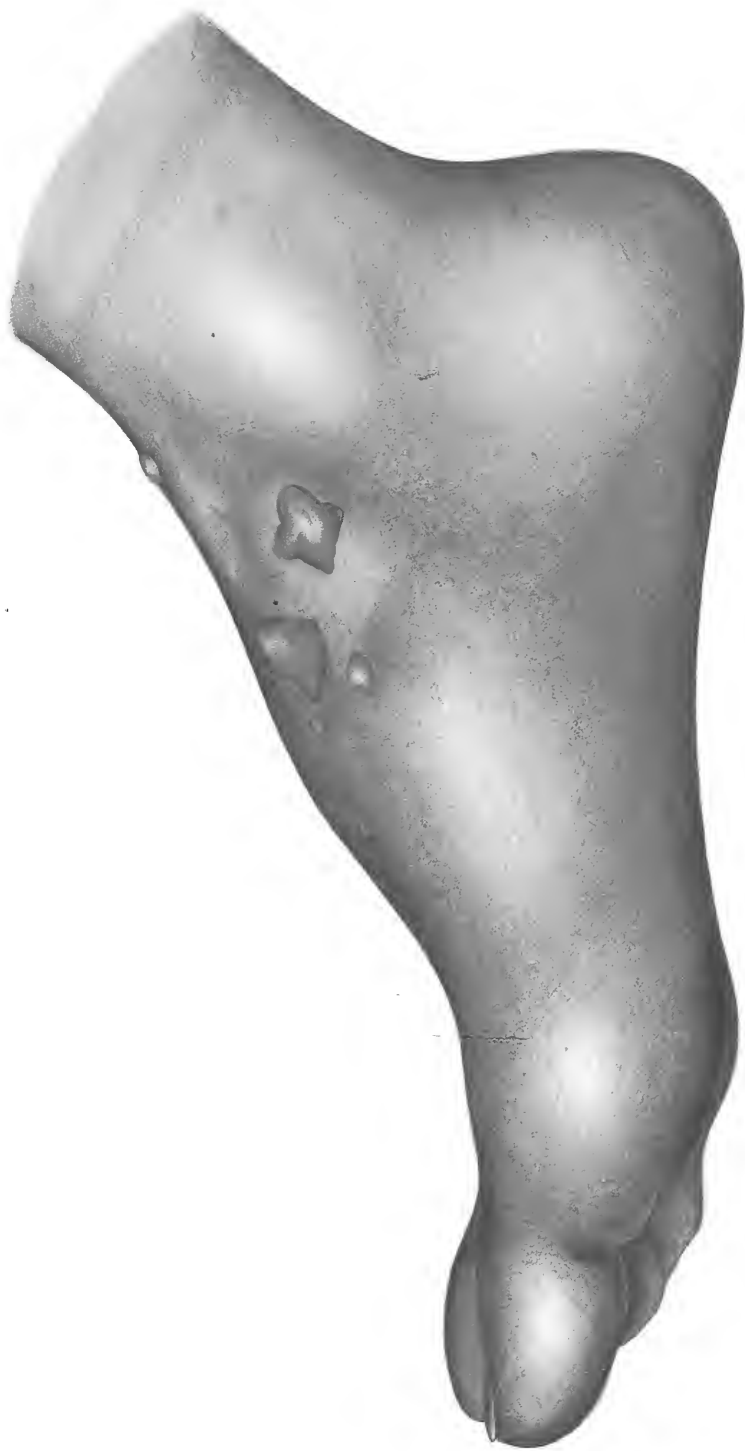
There are at present five scars due to the injury on the dorsal aspect of the foot. One, 1 cm. by 1.4 cm. in size, is situated 6 cm. internal to the median line of the foot and 9 cm. below a line connecting the malleoli. The second,

about the same size, is 7 cm. to the inner side of the first. In the median line and anterior to the first are three smaller scars each about 2 cm. in diameter. They are all dark purplish and hypersensitive to pressure. He is unable to stand up, or, rather, to sustain any part of his weight on the right foot, except for a moment, by resting on the heel alone.

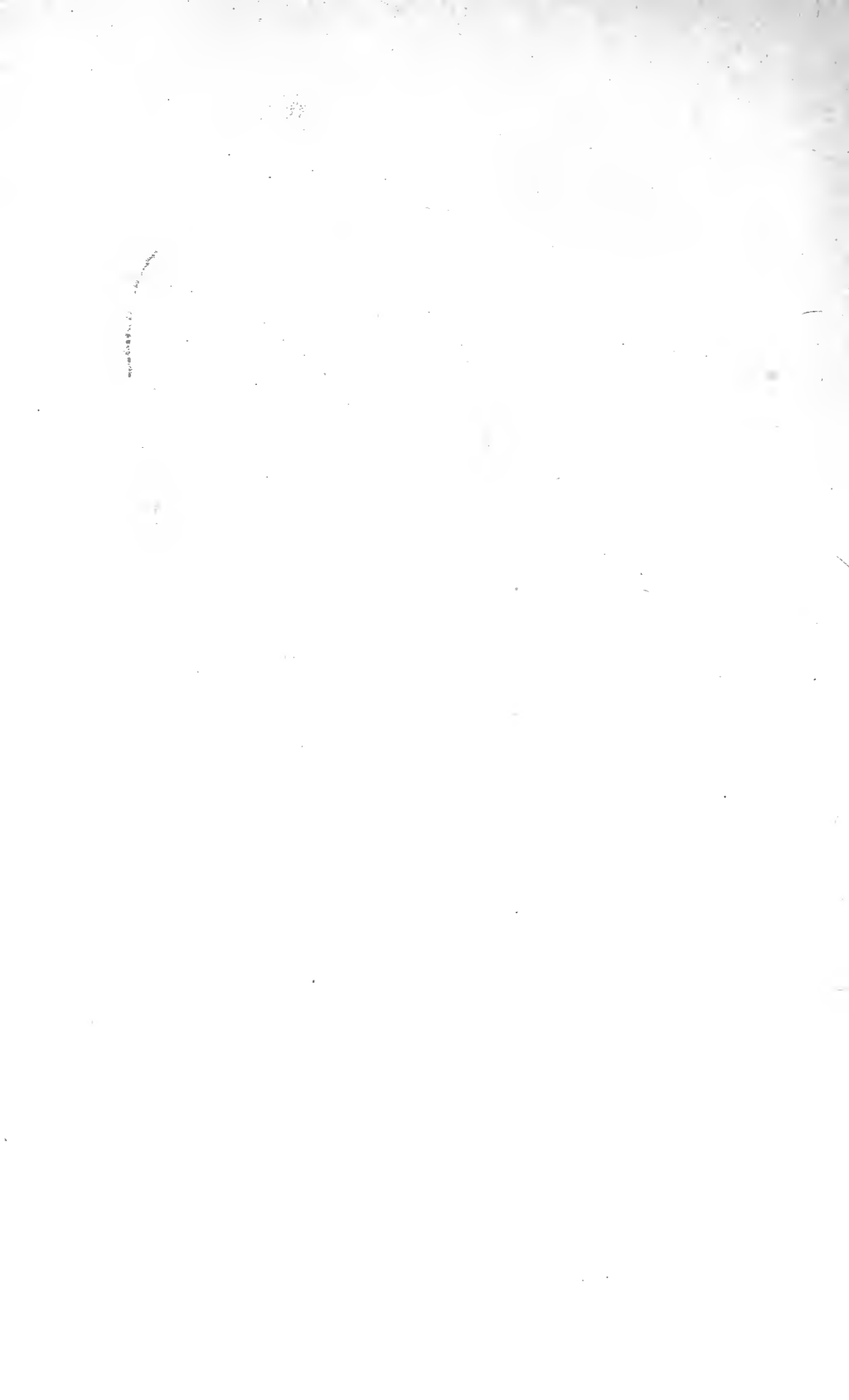
The whole of the right foot, as he lies at rest supine, the leg being extended, is slightly redder in places than the left; but after a few minutes in this horizontal position it is observed that, save for the tint of the scars, the feet are indistinguishable in hue. When standing erect, with the right foot hanging down, the foot becomes flushed at once; the first and second toes assume a bright red, and this extends, appearing here and there in islets of deepening color until the whole foot is of a dark, dusky tint, which becomes more pronounced the longer he is up. The upper limit of redness is marked by a dark-red band on the ankle, $1\frac{3}{8}$ inches above the lower border of the internal malleolus. It encircles the limb, except for an irregular space on the outer aspect.

The beginning of the flush in the pendent foot is marked by increase in the size of the veins and by a visible and rapidly augmented force of arterial pulsations. It is a true vascular storm. After a few minutes the veins remain large, but the arterial throb lessens; the color becomes more and more purplish, but even after a half-hour, when the patient stood on crutches, was never of the smoky tint seen in local asphyxia. When again put at rest and supine all of the vascular symptoms disappeared quite promptly. The whole foot is over-sensitive in all positions. The hyperæsthetic areas differ according as the part is level or pendent. It is hypersensitive to a needle-prick, to heat and to cold, and to pressure. The diagrams make clear the facts without need of fuller verbal statement.

PLATE I.

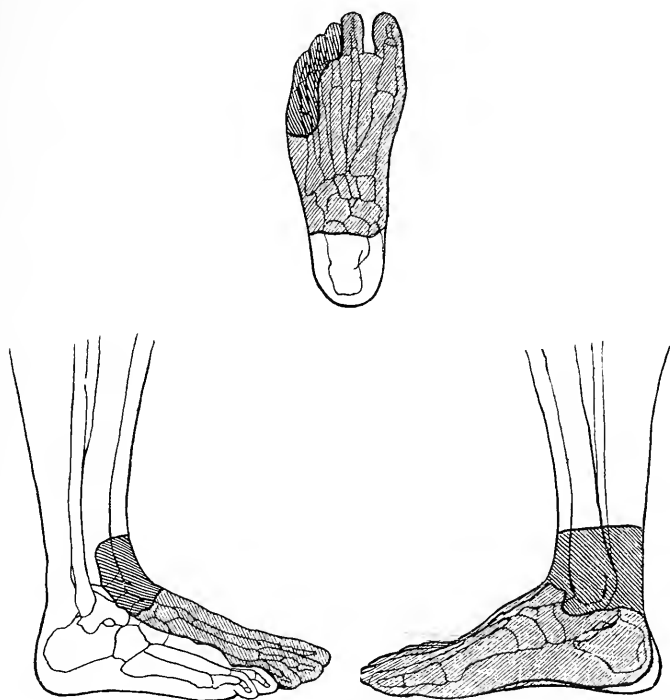


Right foot of T. S. after being pendent twenty minutes. (J. M. Taylor.)



When lying on a level slight touches give no pain, but the least increase of pressure hurts. Pin-pricks cause extreme pain ; all degrees of heat or warmth are over-appreciated up to the knee. The same degrees of heat and also of cold seem, as the case might be, hotter or colder than they appear to be when applied to the other leg. This is also far more notable when the tests are made in the flushed areas.

FIG. 3.



There is constant ache of the right foot, even when at rest on a level. Motion, passive or active, makes it unendurable. If upright, it grows far worse, and he at last becomes faint. When erect the least touch is productive of extreme pain.

The outer side of the foot, supplied by the external saphena, is unaffected ; and this is true of the heel, which

is supplied by the plantar cutaneous branches of the posterior tibial nerve. The rest of the plantar surface, supplied by the internal and external plantar nerves; the inner surface and dorsum of the foot, supplied by the internal branch of the musculo-cutaneous nerve and the long or internal saphenous nerve; the adjoining sides of the great and second toes, supplied by branches from the anterior tibial, which communicate with the internal branch of the musculo-cutaneous nerve, are involved. The area of over-sensitiveness on the posterior leg and thigh is supplied by the small sciatic. The light shading shows the areas sensitive to light pressure, while the dark shading shows the area sensitive to firm pressure.

The drawing, for which I owe my thanks to Dr. Taylor, represents the color assumed when long dependent.

Motion. The power over extension and flexion of the foot is hard to study, because the pain inhibits motion. At rest there seems to be power to move the ankle and toes. Above the knee the movements appear to be with normal power.

Dynamometer: hand, right, 158; left, 155.

There is marked atrophy of the calf-muscles, chiefly involving the anterior group. The circumference of the right calf 5 cm. below the tubercle of the tibia is 27.6 cm.; of the left calf, 30.7 cm. There is also some wasting of the vastus externus and vastus internus, the circumference of the right thigh a few inches above the knee being 39.5 cm., while that of the left thigh is 42 cm.

The circumference of the thigh at the highest point is, on the right side, 51 cm.; on the left, 50 cm.

There is, when at rest, a fine, rhythmical tremor involving the whole leg, and when circular pressure is made about the calf-muscles it is increased. When the leg is long elevated above the level of the pelvis this tremor gradually disappears. Besides this there may be observed, occasion-

ally, clonic spasms of the flexors of the first, second, and third toes, much increased as to number and force when the foot hangs down. There is also seen a fibrillary tremor of the calf-muscles, more especially posteriorly, and of the posterior thigh-muscles.

The foot was occasionally re-examined when pendent. The pain varied, as did also the color. The patient says it is always worse in bad weather. Finally, the foot was elevated on an inclined plane, forty degrees, for three weeks. This rather lessened the pain, but made the whole posterior tibial nerve very tender. After a day or two of rest at a level this passed away; nor has there been at other times sensitiveness on pressure of any nerve-trunk outside of the area of flushing.

When, at the end of three weeks, the foot was permitted to hang down, all of the symptoms at once returned in their utmost severity.

A day later a bandage restricting the return of venous blood was put on at various levels to see if this would cause the vascular storm seen in the pendent foot. It did not. The right foot scarcely flushed more than, under like circumstances, does the normal member.

Reflexes: Right knee-jerk, + +. Spastic; reinforcing by M. and S.

Left knee-jerk, normal.

Ankle-clonus, right, six or eight beats.

Ankle-jerk, right, + +. Spastic.

Ankle-jerk, left, normal; no clonus.

The arm-reflexes are normal.

Muscle-jerks: Right, below knee, excessive as compared with left.

All skin-reflexes are normal.

Electric examination (made by Dr. Willits):

Far.: Foot-extensors, $\frac{1}{2}$ in. coil, right leg; 1 in. coil, left leg. Foot-flexors, $\frac{3}{4}$ in. coil, right leg; 1 in. coil, left leg.

Extensors (tibialis ant.): Galv., K. cl. c., 4 milliampères, right leg; K. cl. c., 5 milliampères, left leg. Flexors: An. cl. c., 5 milliampères, right leg; An. cl. c., 8 milliampères, left leg.

There is, therefore, quantitative increase in the leg-muscles of the affected side; no qualitative change. Sensation to rapid faradic current is lessened on the affected side.

The eyes were examined by Dr. de Schweinitz, who found vision, pupils, fundus, form- and color-fields all normal. The heart has a faint systolic murmur at the apex. The lungs are normal.

Examination of the surface-temperature of the legs gave the following results: mouth, 98.6° F. Legs flat in bed—the thermometer on dorsum of foot, behind great and second toe—right foot, 95°; left foot, 87.8°. Legs hanging over side of bed, after thirty minutes: right foot, 95°; left foot, 86.6°.

Mouth, 101.8° (patient has slight pharyngitis). The patient being flat in bed: right foot, 96.8°; left foot, 94.6°. Legs hanging: right foot, 95.8°; left foot, 92.6°.

Repeated examinations were made. There were marked variations of temperature in both extremities. Once both feet were colder than the thermometers would register, viz., 86° F. The affected foot was always the warmer. The temperature fell when the feet were pendent.

No record of treatment is here added, as nothing did good. The man was wonderfully patient, but wore a look of suffering and was absolutely free from hysteria.

This story, as told in Dr. Rhein's notes, but too well illustrates the obstinacy of grave cases of erythromelalgia, and accords with a long and miserable accumulation of therapeutic failures. I never saw a bad case get well. A few milder examples have varied much,

or even seemed to become well, or remained slight enough to be borne. I know of one case, that of a woman in middle age, in which the pain and flush, limited to the dorsum of the foot, come and go, seemingly without cause. Nothing helps her, but rest in bed is unavoidable. The usual treatments have failed in this present case, and I have no desire to repeat what has proved valueless.

Whatever may have been the originative cause in other cases, here there is a clear story of wound, of the peculiar swelling so common after neural injury, and which has over and over been laid open as an abscess by men not easily deceived. Then there is the gradual increase of tenderness far in excess of that seen in ordinary inflammation. I am of opinion that we have to deal with a neuritis of the foot caused by the wound.

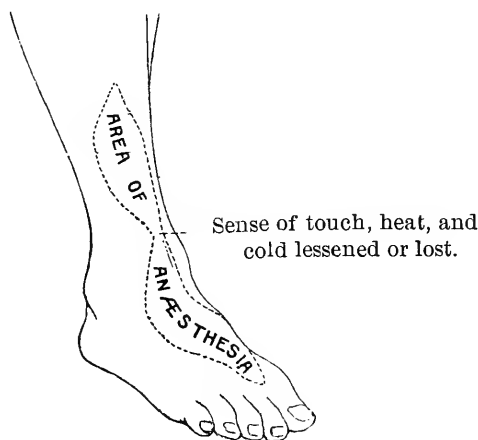
I use the word neuritis—nerve-end neuritis—with more or less of doubt. Some such distinct affection of the smaller nerves does seem to me probable, but whether it is congestion, neuritis, or some other of the undescribed changes in the lesser nerves or in the ultimate nerve-plates, we may not as yet decide with certainty. I shall return later to this question of neuritis. We are now concerned with treatment. I have confessed to complete therapeutic defeat in all my previous cases. It seemed to me that it would in this man's case be reasonable to cut the nerves which are as to motion unimportant, and to do this near to the foot, and as to the two great plantar trunks, to stretch these. I shall ask Prof. Keen therefore to exsect portions of the internal saphenous and musculo-cutaneous nerves and to stretch, as I have said, the two plantars. These meas-

ures ought to destroy largely feeling on the dorsum and the inside of the sole and dorsum, and by the stretching of the terminal branches of the posterior tibial much lessen the sensibility of the sole. The anterior tibial, if one may trust the anatomies, has a small share in the innervation of the foot; but the inosculation and interchange of nerve-fibres are such that I may find, as one does in the hand, that a section by no means strengthens one's esteem for the pictures and statements of the anatomist. The step I propose has not been taken before in this disorder, but is a common enough resort in truncal neuritis. My hope is that the operations I contemplate will lessen the reflex influences which cause the vascular congestion, and will so diminish sensibility as to permit massage to be painlessly employed.

Dr. Keen operated on April 10th. He excised two and one-half inches of the musculo-cutaneous nerve and the same length of two branches of the internal saphenous. The two end-branches (plantar) of the posterior tibial nerve were stretched at the internal malleolus with a traction of fifteen pounds thrice used. The result next day was remarkable. There was almost immediate relief. The foot could be squeezed, pinched, or pricked without pain. Anæsthesia, as shown by the accompanying diagram, was not as extensive as we were led to expect it might be. The day following operation the temperature of the feet was: R., 95° F.; L., 93.5°; mouth, 99.5°. On the right, clonus was still present and the knee-jerk was still excessive. The wounds healed in a few days. On the 4th of May the patient began to walk on crutches. Clonus had then disappeared, and the reflexes were no longer exaggerated. There was still some flushing of the foot when pendent, but no pain or hyperæsthesia. When

discharged May 6th, he could walk well, but was ordered to continue to use crutches as a measure of precaution, and had also a bandage applied daily. Dr. Kyle reports cultures from blood and nerves obtained at the operation as yielding purely negative results.¹

FIG. 4.



On May 12th S. reappeared at my clinic. He was able to walk a little, but refrained, at my request, from much use of the legs. The flush is lessened; the arteries do not throb. He stands and moves without pain. Above all, the temperature of the pendent diseased foot is now less than that of the left member.

June 7th S. is reported well and walking easily without crutches. Six months later he was at his work as a stonemason, and entirely free from pain.

The tendency of recent writers seems to be, as I have said, toward considering erythromelalgia as a neuritis. But suppose we accept this view, and in the light

¹ The pieces of exsected nerve were hardened in Mueller's fluid for some weeks, imbedded in celloidin, and stained with carmine. On microscopic examination the musculo-cutaneous and two branches of the internal saphenous were found to be absolutely normal.

of the two cases I have given it seems more than probable, it by no means sets the matter utterly at rest. Neuritis is becoming a sad puzzle. We may have it with paresis and little pain; we may have it without notable paresis and with horrible pain. It exists with or without myositis. Again, it may give rise to causalgia, joint-troubles, and alterations of nails and hair. It may fail to disturb nutrition or greatly to alter local heat; and lastly, if erythromelalgia be a neuritis, it may cause pain and flushing, and to these, increased enormously by dependency of the part, may add such a rise of temperature as is rarely seen in acute local inflammation.

You see that to give a name to a possible cause does not always help us. If each of these groups of symptoms be due to neuritis, why do they so vary? We may conclude that the nerves are subject, like the spine, to inflammations affecting only certain systems; but in the nerves the fibres of sense of motion and nutrition and vasal control are, as we think, scattered through the parent nerve, whence it seems hard to comprehend the possibility of isolated inflammation of systems. And yet to this we seem driven. The difference in effect between neuritis of a trunk, of the minuter nerves, or of the terminal plates has not as yet been fully considered. Certainly the constant, general, deep, and surface tenderness of erythromelalgia looks to me much like a condition of diffused, what I might call *terminal*, neuritis, sure, like all nerve-end maladies or influences, to cause remote reflex effects. The exsected nerves taken at a part of the nerve-trunk within the flushed area show no signs of inflammation. We may, therefore, conclude that erythromelalgia is

not, as some have thought, a truncal neuritis; but this very negative fact, taken with the symptoms, makes more probable the explanation of a nerve-end neuritis.

Let us return to the phenomena which follow letting the foot hang down. The man is seated. He remarks that to make the foot very red he must stand. At once as he rises the tint gets a brighter rose, and goes on as before described. This is really a vascular storm, and soon the throbbing of the vessels is less violent, and the temperature falls a little or is stationary. In most of these cases pendency causes first a rise and then later a fall of the mercurial column. In this man, as in some others, there is a fall, but less notable on the diseased side.

I think this may vary with the age of the disease. What we see is more than a mere vaso-motor palsy. If it were only that, we could with ease flush the foot when, the leg being horizontal, we tie a ligature below the knee. You have seen how very slightly then the foot flushes. The upright posture and the long column of blood seem needed to get a great effect.

In this present case the muscles are, as to motion, over-responsive to electricity, and, as to sensation, but slightly responsive to the same agency. This is unusual. Indeed, to see excess of response in disease is very rare. Also, there is some wasting in these over-irritable muscles, and this adds to my surprise at their too ready reply to the battery in both forms.

Moderate ankle-clonus is present and right knee-jerk in great excess as a spastic reflex. Altogether the grouping of symptoms is uncommon.

The complex symptom-group here considered is not easy to interpret, especially in the entire absence of

hysteria. Ordinarily—*apart from the erythromelalgia*—the signals in our present case would point to a local spinal and not extensive lesion, and, remembering some other histories of erythromelalgia, we are not unprepared for this conclusion. Even then the riddle is but half-read. Spastic states of spinal birth do not yield excessive electro-muscular excitations, or swiftly fail after nerve-stretching and sections.

It is to be remembered that only the older cases present these quasi-spinal symptoms in grave forms. Allan Sturges's case had wasting, with only quantitative reduction of electric excitability. Whether clonus and spastic knee-jerk are ever only of peripheral neuritic origin we do not know. When I froze my own ulnar nerve, repeating Waller's experiments, the related nerves and muscles acquired for a time a wild excess of excitability to all mechanical impressions. It is really an open question. The gradual loss of clonus after the operation and the lessening of the spastic quality of the knee-jerk seem to me interesting and rather difficult to explain.

The typical form, then, of erythromelalgia is probably a painful nerve-end neuritis with or without co-existent inflammation of the parent stems. Probably, too, although the skin may be of normal tint when the limb is at rest, the deeper tissues are always too full of blood, and the temperature supra-normal. Dependency only exaggerates these conditions, except that as to temperature it does not always do so. The abrupt lessening and final loss of pain, local fever, hyperæsthesia, and flushing under the influence of nerve-section and stretching, make it seem likely that some of these symptoms are reflex from excited or inflamed nerve-ends. When

they can no longer play mischievously on the centres they are in turn released from certain of the morbid additions which stand in the way of recovery. I have over and over tried to bring about the same results by hypodermatic use of opium. I have no record of success, but I see that a recent case is said to have been thus helped.

I have noticed that when the feet are pendent the temperature in the sound foot falls. This result a little surprised me. I find no mention of it elsewhere, and we shall at once study it with care; as a fact in thermal physiology it may be of interest.

In conclusion, I desire to add that I have seen cases of red neuralgia in which the disorder occurred at any part of the surface in isolated skin-spaces. I suspect, too, that in another species there are end-inflamed nerves in some of the viscera and in the muscles. I hope in future to report a small group of such cases.

I add to these cases one in which the operation for relief of this interesting disorder resulted in gangrene and death:

CASE LIX.—April 7, 1894. S. M. H., a physician, married, aged forty-eight years; a stout, square-built man, with good coloring; always well; worked hard in full practice. The first sign of the present trouble occurred in August, 1893, during a holiday in camp. After considerable exertion in carrying over a portage he felt severe burning in the fourth toe of the right foot; but within a day this passed away, and no further trouble resulted until in November of the same year he slipped and wrenched the same foot, after which, in the course of a week, severe burning pains in the sole set in. These were not constant, but came and went, growing worse by degrees. In the intervals of the hot pain

there was much aching in the same territory. When the exacerbations of pain had been severe the ache sometimes extended up the leg. He was able, however, to stand and use the leg a little in going about his work until February 1, 1894, when he found that standing increased the pain so much that he was obliged to give up attempting to do any work on his feet. He continued to practise as far as he was able, spending much time at rest in a supine position or with the foot raised up at frequent intervals. By these aids he succeeded in obtaining temporary ease.

At present the leg aches if long in a dependent position. The foot shows, even when at rest and the patient in bed, more red and white mottling than is usual in other and similar examples of disease. This varies somewhat. At the date of examination it extends as described from the tip of the little toe almost to the middle line of the heel behind, and is about one inch in width. The inner side of the great toe, along the edge of the nail, has a faint red blush, not nearly so deep in color, and from about the middle of the calcaneum at the side of the heel forward to the middle of the arch of the foot on the inner edge is mottled in the same manner, but less darkly. There is a spot over the inner margin of the metatarso-phalangeal articulation of the little toe, which is red and of about half an inch in breadth. In the middle of the metatarso-phalangeal articulation of the big toe is a similar, somewhat larger spot, not quite so darkly red. Wherever this reddish mottling is present is the seat of pain, and the same area is, at its worst, exquisitely hyperæsthetic to touch, but somewhat relieved by gently applied pressure. Throughout this territory some spots are more sensitive than others. The hyperæsthesia is greatest over the area described as at the base of the little toe on the sole. The spot upon the base of the great toe on the sole is very sen-

sitive. The tips of the four lesser toes—not the pulps, but the extremities—are also very tender, but do not show the same amount of redness. These characteristics are perhaps better illustrated by the diagram than by my description; generally the intensity of tenderness corresponds to the degree of redness. The line between tenderness and ordinary sensibility is not very sharply defined.

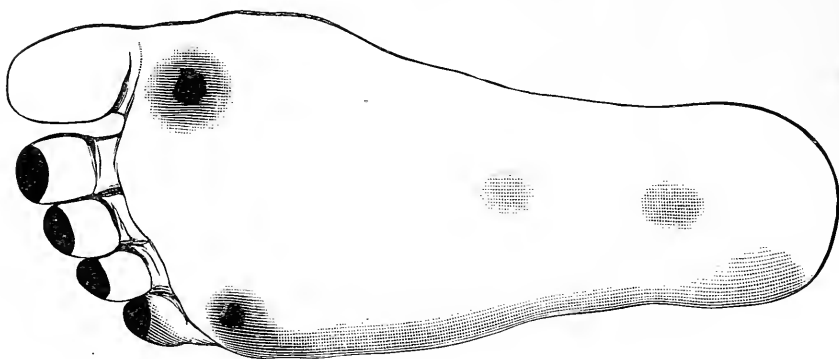
All this description applies in a far less degree to the foot when elevated. Attacks of unbearable pain are brought on by standing, by dependent position of the limb, by warmth, as a hot summer-day; and at the same time the hyperæsthesia is increased. Cold, supine position, and elevation of the leg all ameliorate the pain and the tenderness. The condition of the weather as to storms has little influence. Passive motion gives no pain.

The measurements of the foot are as follows: Right (affected side), around metatarso-phalangeal articulation (largest point), $8\frac{3}{4}$ inches; around instep, 9 inches. On the left corresponding points, respectively, $8\frac{3}{8}$ and $8\frac{3}{4}$ inches—a slight difference, the increase being upon the bad foot.

Standing for a moment or two somewhat relieves the pain and tenderness, but immediately a great increase of pain results. After being thirty seconds upon his feet there is a marked change in the color on the edge of the foot, especially on the little toe and the neighboring joint, the whole becoming a livid, deep, mottled red, almost purple in places. Both sides of the instep sweat a little after standing, and there is then greatly increased hyperæsthesia. There is now no marked throbbing of the arteries in this position or after it, and the red blush does not seem to spread over the foot much beyond the outlines of redness seen when the foot is at rest and elevated; it only becomes far more marked. Knee-jerk is excessive upon both sides, more on the right. There is no ankle-clonus and no trace

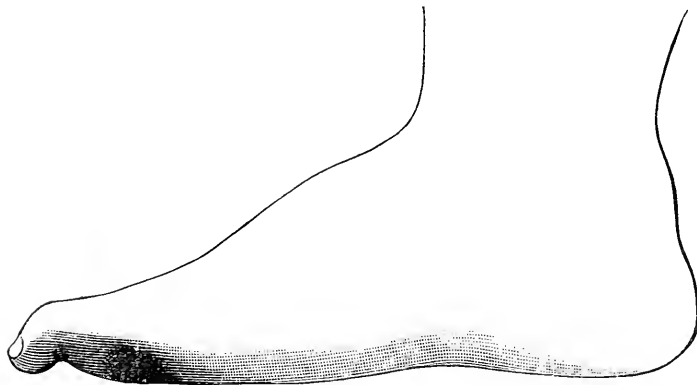
of tenderness of the nerves up the leg. The dorsum of the foot does not share in the redness or tenderness at all. The diagrams and colored print sufficiently illustrate the symptoms I have described.

FIG. 5.



Sole.

FIG. 6.



Outside of foot.

Degree of tenderness is represented by depth of shading.

The patient was examined repeatedly and with the utmost care by the author, by Dr. John K. Mitchell, and by Dr. Morris Lewis. The lungs were normal; the heart and vessels at the wrist and elsewhere were apparently free from disease. The arterial tension was not in excess.

PLATE II.



Foot hanging down for thirty minutes. (J. M. Taylor.)



There was no arcus senilis, and the morning urine was normal. That passed at bedtime showed a few pus-corpuscles—no casts—and once a faint trace of albumin with the superposition acid test. The following record of surface-temperatures shows the results of examinations on two consecutive days:

April 7, 1894. Surface-thermometer placed over the very red spot on sole of right foot near base of little toe.

A. Leg held horizontal on couch 20 min.	31 $\frac{2}{5}$ ° C.
Leg placed perpendicular (foot down) 10 min.	32 $\frac{1}{10}$ ° C.
Temperature rose	$\frac{4}{5}$ ° C.

The foot became much congested.

Thermometer then placed over ball of great toe.

B. Leg now horizontal for 20 min.	35° C.
Leg placed perpendicular 10 min.	35 $\frac{3}{10}$ ° C.
Temperature rose	$\frac{2}{10}$ ° C.

April 8, 1894. Thermometer placed over dorsum of right foot.

C. Horizontal 20 min.	34° C.
Then standing 10 min.	34 $\frac{3}{5}$ ° C.
Temperature rose	$\frac{3}{5}$ ° C.

Comparison of left (unaffected foot) at same time and place.

D. Horizontal 20 min.	29° C.
Standing 10 min.	28° C.
Temperature fell	1° C.

The rise of temperature here apparent in the foot when hanging down and the patient upright on crutches is such as is often seen early in cases of red neuralgia. The contrast where the normal left foot loses heat when the patient is erect, is significant of what, as I have shown elsewhere, is to be expected.

There seemed to me no doubt as to this case being a typical example of erythromelalgia. Nor could I see why I should not recommend with confidence the operation which in another had effected a radical cure.

The patient was suffering as intensely as any such case within my experience, and there seemed no reason to regard the operation as serious.

Accordingly, on April 12, 1894, Dr. T. G. Morton operated precisely as in the case just referred to. The ether was taken without the least difficulty. An incision was first made over the ankle and the musculo-cutaneous nerve picked up and excised for four inches. Next the internal saphenous was excised for five inches above the ankle; then making an incision four inches long over the posterior tibial nerve behind the inner malleolus, this nerve was stretched by passing the curved hook under it at its point of division into the two plantars. A force of twenty-eight pounds was applied, as shown by the attached scales. The incisions were closed with continuous silk sutures, dressed with sterilized gauze, and the patient put to bed with the foot elevated. He had considerable pain that night and required morphia. Stomach remained very irritable for some hours after the operation, and the patient became very nervous. Four days later he still continued to be excessively nervous and excitable, and had much pain in the limb and foot. For this reason it was impossible to test sensation accurately. He could feel a towel passed over the foot, however. It became impossible to keep the foot quiet on account of his extreme restlessness and complaint of pain in the foot. Finally the dressings were removed and cold applications were applied with some relief.

On the fourth day Dr. Morton became uneasy at the absence of circulation in the toes. I myself was out of the city, and the case was for a time altogether in the hands of the very skilled surgeon who had operated. It was now becoming plain that the foot was threatened with gangrene. On the fifth day the patient's friends announced their intention to take him away from the hospital. This was

done despite every remonstrance. Elsewhere, a week after, an amputation was attempted, and was followed by death upon the operating-table.

I have been unable to obtain full details of the later symptoms. Circulation was arrested in the foot before he left us, and when the amputation was effected there is said to have been some necrotic disease around the lips of Dr. Morton's incisions. I understand that no post-mortem section was allowed, and that permission was obtained with difficulty to examine the leg after its removal.

I am indebted to Dr. P. S. Hall for all that I finally know of this unfortunate case. At the second operation the ether was taken without any unusual trouble; but suddenly at the close of the operation the patient became livid, breathed with difficulty, and died, as has been related. In the popliteals a long, soft clot was found, the upper extremity of which showed signs of rupture and detachment. There was probably pulmonary embolism.

All the vessels of the amputated member showed "thickening of the middle coat" (*i.e.*, the muscular walls). This obtained in even the smallest arterioles in the sole of the foot, while in the larger vessels here and there, in addition, were calcareous deposits.

Further histological study will be necessary to complete the case. It is to be remarked that Dr. Burr found no change in the portion of excised nerve removed by Dr. Morton.

This was a plain case of erythromelalgia. The examination of sections of smaller vessels made by Dr. Hall enabled me to verify his statements. Degenerative changes limited to these lesser vessels are rare,

nor do I know how during life to detect them. In the absence of an autopsy the remoter causes of the final disaster must remain unknown. As to operative relief, I think that in the future I should stretch all the nerves, and leave resection of their trunks to be resorted to if the milder means gave no fortunate results.

CHAPTER XI.

NOTES ON SURFACE-TEMPERATURES AS AFFECTED BY POSTURE OF LIMBS.

I REMINDED you last winter of the endless possibilities open to mere observation in clinical medicine when pointing out the peculiarities of local temperatures in a case of erythromelalgia.

To become sure as to general temperatures in a case of disease is usually easy, requiring only ordinary care and good thermometers; but to get surface-temperatures accurately is a more difficult matter, demanding, as it does, more time, far greater care, and instruments that as yet are very unsatisfactory, either because they are too slow in registering or too fragile. I commonly employ the coil-bulb thermometer, guarding the coil with a cork, hollowed so as to roof over the coil, and perforated to admit of the passage of the stem. The instrument must remain long on the part. It may be kept in place by a very thin caoutchouc band, split so as to be passed over the tube, and arranged so as to lie lightly around the limb with just enough pressure to keep it in place. Thus the contact is kept equally the same, and in comparing the two members great care must be taken accurately to repeat this and other conditions. If the pressure be too great, it is sure to affect for a time the thin walls of the bulb, and then, as the instrument is lifted, the column instantly falls a little, this amount representing rise from excess of pressure. The coil-bulbs are less subject to this source of error.

The study of skin-temperatures has been fairly well made, but even yet may gain in accuracy and completeness. Moreover, there are some points as to normal temperatures rarely considered by neurologists in comparing the heat of symmetrical regions. Certain of these have come out clearly in the study made during the last year by me, and under my direction, by the staff of the Infirmary, notably Drs. F. S. Pearce, Taylor, Burr, and others.

Minute precautions are essential in dealing with minute differences, and in fact one may take it as a rule that the finer the instrument the finer must be the human instrument using it. We still need a perfect surface-thermometer.

As the rise or fall in cases of local neuritis may be but slight, it is well to remember that normal differences as between right and left members are by no means uncommon. If, for illustration, in this healthy man at rest and supine, we apply the surface-thermometer and leave it at least ten minutes on the dorsum of the right foot, it notes 35.6° C., and on the left 35.2° C. Here is a fact of interest. The two feet are not always alike in temperature. At times the amount of difference is 1° C. Now let the man stand up, and with the thermometers in the same places they come to mark 35.4° C. and 34.9° C. respectively. This is one example taken at random. Meanwhile the mouth-temperature has remained unaltered. Certainly this is an interesting fact; it may have escaped notice.

Last spring, in a case of red neuralgia, we were measuring the temperatures of the feet in bed, and when hanging over the edge, or when dependent from the hips, the man being on crutches. In the acute stage

of this disease dependency of limb is apt to cause a rise of local temperature; but in the case in question, and perhaps in all when the disorder has lasted long, there is, under these circumstances, a fall of temperature and not a rise.

The fall in this case led me to study anew the natural thermal conditions, and after personally learning that the normal foot when dependent is likely to fall in temperature, I asked Drs. Taylor and Burr to test the matter. They both found the observation to be correct in themselves and in several of our nurses. I then asked Dr. Pearce to make a series of observations on the foot and hand. These have been made with care and skilfully varied. To save space I give the figures in tabular form.

No.	Time.	Position of right leg.		Position of left leg.	
		Horizontal.	Standing.	Horizontal.	Standing.
1 . . .	P. M.	35.6°	35.4°	35.5°	34.9°
2 . . .	P. M.	34.6	34.4	34.6	34.6
3 . . .	A. M.	33.6	32.8	33.6	32.4
4 . . .	A. M.	31.4	30.0	31.6	30.2
5 ¹ . . .	P. M.	34.4	34.0	35.4	33.4
6 . . .	A. M.	34.8	33.2	34.0	33.2
7 . . .	Noon.	35.0	35.0	35.8	35.6
8 . . .	P. M.	35.6	34.2	35.8	35.0
9 . . .	A. M.	34.2	33.2	34.6	32.2
10 . . .	P. M.	33.6	31.8	34.0	32.4
11 ¹ . . .	P. M.	33.6	31.0	34.2	30.4

¹ Experiments 5 and 11 were performed upon two old cases of erythromelalgia of the *left* leg in men twenty-one and thirty-four years of age respectively. All others were upon healthy persons.

In the preceding eleven experiments upon the *dorsum* of both feet (at the same time) the thermometers were read in twenty minutes, as the subject lay supine; then ten minutes later, the subject standing for the same length of time. The extremities were kept uncovered and away from draughts. The centigrade scale was used. The temperature of the room was 68° F.

The same conditions obtained in the following experiments upon the *soles* of the feet:

No.	Time.	Position of right leg.		Position of left leg.	
		Horizontal.	Hung over edge of couch.	Horizontal.	Hung over edge of couch.
12 . . .	A. M.	33.6°	33.2°	34.0°	33.8°
13 . . .	P. M.	34.8	34.4		
14 . . .	P. M.	36.0	35.2		
15 . . .	A. M.	31.6	30.6	32.0	31.0
16 . . .	A. M.	30.8	30.4	29.0	29.0

The same conditions, the patient lying supine continuously:

No.	Time.	Palm of left hand.	
		Horizontal on couch.	Held up vertically.
25	P. M.	35.6°	35.4°
26	P. M.	34.6	34.2
27	P. M.	35.2	35.0
28	A. M.	35.6	35.4
29	A. M.	35.1	35.0
30	A. M.	34.4	34.0
	P. M.		

The conclusions that may be formulated as to surface-temperatures are as follows :

The temperature of the dorsum and sole of the feet is on an average from $\frac{2}{5}^{\circ}$ C. to 1° C. less when standing erect than when lying horizontally.

All things being equal, the morning surface-temperature is less than the evening surface-temperature on the dorsum or sole of the feet.

The mouth-temperature varies little as between lying down and standing; or, if it changes, there is a very slight rise.

The nearer the trunk the less do the surface-temperatures vary in different portions of the body.

The palms of the hands are the warmest parts of the extremities; their surface becomes less warm as the extremity is moved from a resting horizontal position to one of hanging down loosely, and finally to being held up in a vertical position.

The foregoing obtains whether the body lies supine or is held erect.

The two hands or the two feet vary somewhat in temperature in the same person under apparent equality of conditions. At times the right member is warmer; at others it is the left.

CHAPTER XII.

THREE CASES OF REMARKABLE SPINAL ANTERIOR CURVATURE WITH MENTAL ABERRATION.

I SHOW you to-day two out of three cases of somewhat unusual character. The third member of the group I have not here. You cannot fail to observe at once the attitude of this girl. Let me ask your attention to this singular case. The curvature came and grew complete within a few months. It is still remarkable, and was far more so. The whole spine was bent forward, the belly protruded, and the head carried back, to enable her to see objects on a line with the eyes. There was no possibility of straightening her either by passive efforts at suspension or through volition, but these attempts gave rise to no pain. The spine seemed to be rigid, and she could neither make it erect nor fully bend to one side; the head also possessed small power of rotation or flexion, while the neck-muscles were not rigid. With the gain in her mental state these peculiar symptoms have become notably less.

This description also applies nearly throughout to the man, except that his spinal difficulty was altogether above the lumbar region. The girl's case is, no doubt, largely hysterical, and so also is that of the boy, who had in an extreme degree the spinal peculiarity.

The man's condition hardly justifies the label hysteria; nor did that of two others alluded to later.

Here, then, are three people—a boy, a girl, and a man—all more or less insane, and all showing a

disorder of the vertebral column, which comes with the mental state, and lessens as this gets better, and is not due to appreciable organic disease.

How very strange are the postures is shown in Dr. Taylor's sketches. In a large experience of all forms of mental disorder I have never seen elsewhere anything just like these in the pronounced character of the curves and in the immobility which they manifested.

The boy's case is less distinct, but the resemblance to the others suffices to justify the grouping. Perhaps this collection of symptoms may be accidental. The chance grouping together of symptoms in a trio of cases may readily deceive one into the belief that we have before us an undescribed clinical type. I have been patiently reticent, and have long withheld these three cases from publication, in the hope of seeing others like them, which might permit of a larger numerical comparison. My patience has not been rewarded with success, and I am now tempted to call attention to a peculiar set of symptoms, with the hope that others may contribute like cases to my meagre list, so that a larger experience may become possible. I incline to the belief that the cases I here exhibit illustrate a novel clinical group, which may be non-hysterical or may assume the hysterical type, and to which I hesitate as yet to affix a label.

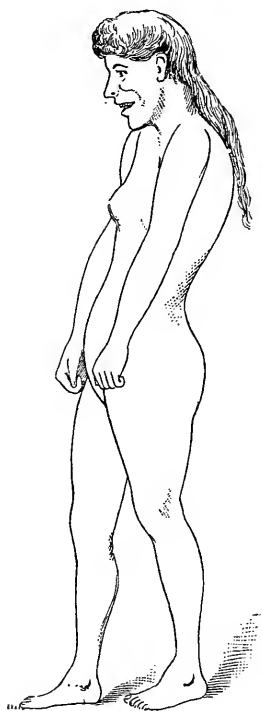
I ought to say, also, that in the past I have met with at least three patients who had this collection of symptoms; but of these I have no notes, as they were seen long years ago, and only in consultation.

The question is now in this form: Is there a clinical type, hysterical or not, characterized by mental failure, physical weakness, retinal changes(?), and rapidly

evolved spinal curvature, extreme in degree and otherwise unusual in type, not due to organic vertebral disease?

CASE LX.—F. B., female, thirteen years of age, was brought to my clinic April 4, 1890. The family history is negative. The child was born at term. The labor was easy, and instruments were not used. She was breast-fed. She began to walk at thirteen months, and to talk at

FIG. 7.



about the same time. She has never had any serious illness except pneumonia, seven years ago. She developed well, mentally and physically, until about eleven months ago, when her mother noticed that she had fits of causeless crying and great depression. At times she would convulsively break out in attacks of violent anger. While

previously she had always been number one in her school, she soon lost all interest in study, fell to the foot of the class, and finally refused to go to school at all. She sits all day, careless and unconcerned as to what is going on around her. She will have nothing to do with her old school-friends, shows no affection for her parents or brothers and sisters, and never speaks except in answer to a question, save that sometimes she talks to herself, and, as if under the influence of an hallucination, will cry out, "What do you want?" "Get out of here," etc. She has largely lost the sense of personal cleanliness and is dirty in her habits.

Her general bearing is striking. The abdomen is thrown forward, the shoulders back, the right one being much higher than the left, while the head is thrown forward, the chin at times resting upon the chest. The left thumb is strongly flexed, the forearm pronated, and the arm rotated inwardly. The entire spine bends stiffly, and it appears impossible for her to stand erect. She stands, as shown in Fig. 8, on the heel of the right and the toe of the left foot. There is no evidence of spinal bone-disease, no angular curvature, no pain on pressure, no sensitiveness to heat or to cold. While there is a little general muscular weakness, there is no true palsy, and except for slight pallor she is well nourished. There are occasional slow, lateral movements of the head, and the hands are slowly passed over each other. Whether these movements are purposive or automatic cannot be determined. The fingers of both hands can be passively hyper-extended.

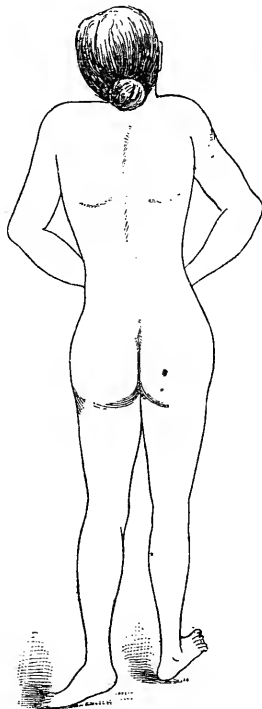
Her expression is fatuous and idiotic. She seems to take no notice of her surroundings, and is absolutely without interest in anything. Her replies to questions are silly; her speech slow and somewhat thick.

She sleeps well now, but formerly slept badly, and seemed to fear the dark. Menstruation has never appeared, though she is quite well developed. Her appetite is fair. The

urine is normal. The knee-jerk is slightly large, but not spastic. Sensation is normal.

Dr. de Schweinitz examined her eyes, and reports: "Concomitant convergent squint. No swelling of disc, but there is a diffuse retinal haze, especially marked above and below the discs. Both eyes are hypermetropic."

FIG. 8.



The patient was seen again in February, 1893. Her mental condition was even worse than before. She never spoke except in a silly fashion, and had to be attended to like an infant. She still had outbursts of anger. Physically she was in about the same condition as already described, except that the protrusion of the abdomen and the large anterior curvature of the lumbar and lower dorsal spine were less marked.

September, 1893. She has steadily but slowly improved since the last date, with lessening curvature, but the gain in the physical aspects of the case far outstrips the gain in the mental condition. The eye-grounds are better.

She continued to improve physically. The back lost its curve, the belly became as to form natural, the head assumed a natural position, and very much more slowly she recovered her health of mind, and is now considered to be as well as before the onset of this singular malady.

CASE LXI.—L. W., male, twenty-five years old, married, a mill-hand, came to the clinic November 22, 1889.

The family history is negative. The patient denies venereal disease, and no evidence of it is discoverable. He has used no liquor and tobacco only moderately. He had always been well until June, 1888, when his employer discharged him on the ground of mental unfitness for work. He complains of backache and headache. He says that he often hears voices of invisible people talking to him, but he cannot remember what they say. He denies that he ever gets despondent, and is totally unconscious of any mental trouble.

His general bearing is precisely similar to that of the first case described. The head is kept flexed on the breast, the eyes wide open, the dorsal curve and rigidity most remarkable; nor could they be altered by effort, voluntary or passive. The gait is shuffling and slow, and the right foot is much everted. Station is good. The knee-jerk is large, but not spastic. Sensation is normal. There is no paralysis.

His expression is dull and sleepy. Mentally he is stupid. He understands what is said to him, and replies intelligently, but often his statements cannot be relied on. He will unwittingly falsify. He has lost all interest. His inability to work is evidently due to mental insufficiency, and not to the pain of which he complains. He is harm-

less and never subject to fits of anger ; and, on the other hand, he is without affection. In other words, he is in a condition of dementia.

The abdominal and thoracic organs are normal. The eyes were examined by Dr. de Schweinitz, who reports that there is a slight retinitis.

He was seen again some months later, in the spring of 1890, and had improved sufficiently to do odd jobs, but was still unfit for continued work. The spinal curve was far less and the mobility nearly normal. The eyes were reported to be materially better. He was far more cheerful, and observed with interest that he was much more erect and did not have to tilt his head back and lift his lids to get a full view of the faces of people. At this time there was a complete re-examination, which added nothing to the simple statements already made. He continuously improved, and I was informed made a complete recovery.

CASE LXII.—L. R., male, sixteen years of age, was sent by Dr. Pearce, of Steubenville, Ohio, in March, 1890. The family history is negative. The patient suffered no injury at or near birth. He has never had convulsions or any other serious acute illness. He has always been very retiring, seldom speaking unless spoken to, never mirthful, averse to society, and not fond of amusement. He attended the public schools for six or seven years, but was always careless and indifferent about his studies, and as time passed grew duller and duller. About two years ago his comrades annoyed him so much that he was taken from school, and for a while he was taught at home. Finally, however, all efforts at education had to be abandoned. He still possesses intelligence enough to read, but rarely does so. He understands perfectly all that is said to him, but is morose and irritable. He cries a great deal, and is without affection. He is extremely disobedient and without fear of punishment. He protests that there is nothing

the matter with him ; says dramatically that he will live a thousand years, and that he wants to be left alone. He often gets upon his hands and knees on the floor, and, turning his head in an objectless manner toward the ceiling, remains so for a considerable time. His usual position is sitting with the thighs strongly flexed on the abdomen, the legs flexed on the thighs, the arms clasped around

FIG. 9.



the legs, and the head down, with the chin resting upon the knees. This knotted position he maintains for hours. At times he suddenly rises, hops, or runs around the room, whining the while, always going to the left if he meets a table or chair or other obstruction. He will stop suddenly, jump up and down many times, frowning and looking horror-stricken, and then walk away and sit down in his

accustomed attitude. He objects much to being touched, saying that it hurts him ; but deep pressure does not give so severe pain as a light touch. His hyperæsthesia is mental, not peripheral. He is reluctant to talk to any one, or even to answer a question ; and when he does so he repeats words, a clause, or even a sentence several times, so that frequently it is difficult to comprehend what he says. He is, however, sometimes boisterous, and will swear roundly and scold every one around him, and squirm and jump and throw himself about, and finally fall to the ground exhausted, panting for breath, grasping at his chest as if in deadly fear of suffocation. He complains bitterly of new clothing, saying that it is too tight and binds him. He has great trouble in dressing and undressing, but objects strongly to being assisted. He will apparently forget what he is doing ; will put on a shirt and not remember that a coat should follow. The same peculiarity is shown in eating. It is no unusual thing for him to sit at the table for hours muttering to himself, and only now and then taking a mouthful of food. So bad is this that he sometimes suffers from want of nourishment. He goes to stool of his own accord, but may be found thus engaged hours afterward. The character of his sleep varies much ; sometimes it is quiet and restful, at others much broken.

The illustration shows well the peculiarities of his usual position when standing. The legs are slightly flexed at the knees, the abdomen thrown forward, and the shoulders rounded. There is increase in the normal antero-posterior spinal curvature and slight left lateral curvature. There is no evidence of bone-disease. He stands with the legs in partial flexion. This bending can be overcome by passive, but not by active motion, and the spine can by no means be straightened. The skin is yellowish and harsh. The knee-jerk is lessened, but distinctly reinforcible. The thoracic and abdominal organs are normal. Careful watching

has failed to detect evidence of masturbation. The eyes appear to be normal.

When heard from, three years later, he had improved considerably, the change coming on rather suddenly in March of this year. He said one day that he had been out of school so long that he would be behind the boys, and asked for his books. A teacher was obtained for him, and he became obedient and cheerful and desirous to study. The gain has been happily continuous, and, as in the other cases, the change in carriage and the lessening of spinal immobility have gone on as the mental state has become clearer.

I find it more than merely difficult to discuss these three cases. They seem to me to belong to one group; but if in my ample experience I can recall but two or three like them, I think we must concede them to be of extreme rarity. Perhaps my report may lead, as usual, to the publication of other examples of what I am inclined to regard as a very distinct clinical genus.

CHAPTER XIII.

CONCERNING THE HISTORY OF THE DISCOVERY OF
REFLEX OCULAR NEUROSES, AND THE EXTENT TO
WHICH THESE REFLEXES OBTAIN.¹

As skilled ophthalmologists, you must be aware that you touch the general practice of medicine at many points, and very often are most helpful ; but sometimes, because of being satisfied to think only of the eye, may quite fail to be as helpful as you might be.

Nowadays, except for obvious eye-trouble, you are most likely to be consulted as concerns headaches, and to be asked if they are in this or that case the offspring of disorders of the visual apparatus. Very frequently the patient goes directly to you, so that you become his only adviser, and it is as to this form of undivided responsibility that I shall have to speak before I close; for it is here that you sometimes fail to grasp the truth that he who has properly corrected the eye may have left undone that without which his work loses much of its value.

Before dealing with this and other more practical matters, I should like to call your attention to the general history of the connection of headaches and other neuroses with eye-strain. I am the more interested in doing this because I had a personal share in directing the attention of the medical public to this matter, and

¹ An abstract of remarks before the Ophthalmologic Section of the College of Physicians of Philadelphia, March 26, 1894.

also because it is my belief that we of this city were the first to bring this relation into large practical prominence.

I am under the impression that Dr. Ezra Dyer and Dr. J. Haskett Derby, of Boston, were the first Americans to bring us home from Germany modern views as to corrections to be accomplished in disorders of the optic apparatus.

Dr. Dyer came here to live in 1862. From this accomplished oculist I learned a great deal in regard to the treatment of the eyes, and it was through certain cases thrown into his hands by me that I came first to apprehend more fully the mischief-making capacity of imperfect eyes.

I remember with great distinctness the earlier of the many important cases I saw with Dr. Dyer. Some of them made a serious impression upon my mind. One was that of a young woman whom I had known for many years to have exceedingly disordered eyes, and to be unable to use them for more than a minute at a time without pain. She suffered a great deal from headache, but although she had seen many physicians, neither they nor I, nor Dr. Dyer (whom she consulted as to her eyes), had any suspicion that the eyes were almost the sole factor in the product of pain. The headaches were entirely occipital. Dr. Dyer carefully glassed this young woman, merely to aid her vision, and shortly afterward, in some two or three months, she told me that her headaches had entirely disappeared, but that they returned if from any cause she was without her glasses for a few days.

This fact struck me very forcibly. Shortly afterward I met in consultation the late Dr. John F. Meigs,

concerning the case of a young widow who had suffered for many years with extreme headache, pain down the spine, and also with what at that time I considered as hysterical spasmodic retraction of the head. After we had talked the case over, Dr. Meigs said to me that his medical resources were exhausted as to this case, and that he did not know what caused the headaches. I then asked if they might not possibly be due to what at that time I was beginning to call "eye-strain." He said it was possible, but that he had never met with or heard of such a thing. I got his ready consent to refer his patient to Dr. Dyer. Careful correction promptly relieved these headaches. The stiffened muscles at the back of the neck relaxed, and four months afterward this woman was in better health than she had been since childhood. These, and other cases, at last opened my mind to a distinct conception of the frequency of the relation between disorders of the apparatus of the eyes and headache or other neuroses.

As Dr. Dyer's practice enlarged, and as physicians began to have increasing confidence in the modern methods of correcting the eyes, I, too, learned still more of these interesting difficulties. I think the knowledge that a headache might be due to ocular troubles was becoming pretty well diffused among the more intelligent of the profession in Philadelphia, when, in the *Medical Reporter*, in 1874, in writing of headaches, I described headaches from eye-strain, and gave several cases at length. These cases were corrected by Dr. Thomson. The cases seen with Dyer occurred as early as from 1862 to 1864; I cannot more surely set the dates. I then got the impression, which I still retain, that hemicrania of the classic type, although it may be

increased and made worse by ophthalmic defects, rarely owes its existence to this alone, and that headaches of eye-strain are usually of quite different type.

I did not again write on the subject until 1876. In April of that year I published a paper in the *American Journal of the Medical Sciences*. I there stated the following conclusions, having learned that not only headaches, but vertigo, nausea, anæmia, and much disturbance of the general health might be due to imperfect eyes. At that time I summed up my opinions as follows :

1. That there are many headaches which are caused by disorders of the refractive or accommodative apparatus of the eye.

2. That in some instances the brain-symptom is the most prominent, and sometimes the sole prominent symptom of the eye-troubles ; so that while there may be no pain or sense of fatigue in the eye, the strain with which it is used may be represented by occipital or frontal headache only.

3. That the long continuance of eye-trouble may be the unsuspected source of insomnia, vertigo, nausea, and general failure of health.

4. That in many cases the eye-trouble becomes suddenly mischievous, owing to some failure of the general health, or to increased sensitiveness of brain from moral or mental causes.

It may be somewhat interesting to carry the history of the subject beyond this point. The knowledge of which I speak is perhaps one of the most valuable contributions to the relief of human suffering that has been made during the century. It is impossible to give the credit of this vast gain to any one man, and to say with

truth that it was due to him alone. Helmholtz, Donders, and von Graefe made this relief possible by their scientific work ; but neither in Europe nor here was there, so far as I know, in 1862, or much later, any practical conception among either oculists or physicians as to the frequent power of bad eyes to create headache and divers other troubles. No physician then sent headache-cases to an ophthalmic surgeon, and my paper of April, 1876, was, I think, the first contribution of importance to this subject made from the standpoint of the general practitioner.

In fact, one looks in vain for many a day through the text-books on the eye, and the monographs on headache, for a statement of the imperative need to study the eyes in headache, vertigo, etc. If here and there we find a sagacious ophthalmologist speaking of the distress and pain which manifest ocular trouble occasions, the general text-books are silent as to a practical hint, and the profession at large remains ignorant.

Quite recently, in 1886, there appeared Ernest Clark's book on Eye-strain, and here is full confirmation of what I state, and, too, of Dr. Clark's entire failure to make clear our share in the valuable discovery I am discussing. This author points out that fifty years ago Tyrell, in speaking of asthenopia, very well described its power to cause *headache, dyspepsia, vomiting, diplopia, vertigo, and palpitation*. He even employed the term "*eye-strain*," its first printed use, I suspect, in connection with this subject.

I find in Dr. George Stevens's book on Functional Nervous Diseases, published in 1887, information which enables me to carry forward the history of this subject. He says, page 8: " No general principle of sympathetic

or reflex irritation had, however, been formulated, and the first *printed* announcement of the existence of such a principle was made by myself, in a paper presented to the Albany Institute in the early part of 1876" (On Some Results of the Anomalous Refraction of the Eyes). It is difficult to understand this claim.

The paper to which Dr. Stevens alludes here as presented to the Albany Institute was read by title before the Institute, May 30, 1876, and placed on file to be presented thereafter; but I do not find it anywhere stated in the Transactions or Proceedings of the Albany Institute that it was ever read or printed.

Soon afterward a paper, by the same author, was read before the Academy of Medicine in New York, June 15th of the same year (Refractive Lesions and Functional Nervous Disorders). This paper deals with the question of chorea chiefly. Dr. Stevens attributes a very large proportion of choreal cases to hypermetropia. As to this matter I shall have more to say before I close.

In the New York Medical Record, September, 1876, there is also a paper by Dr. Stevens upon the Relations between the Anomalous Refraction of the Eyes and Certain Functional Diseases of the Nervous System, with a table showing the refractive condition of the eyes in fifty-four cases of epileptic and insane persons. This paper deals with the fact that refractive errors are common in cases of epilepsy and the like, and with the great frequency with which refractive anomalies have been found in connection with recurrent headache. As to this matter, too, we have the later papers of both Drs. Stevens and Ranney, concerning which I shall also have a few words to say.

I find later, in the New York Medical Journal for June, 1877, a paper by Dr. Stevens (*Light in its Relation to Disease*), which I presume is the same as one presented to the Albany Institute December 19, 1876. It deals chiefly with the question of heredity in connection with faulty refraction of the eyes and other matters.

In looking over the later history of this matter I find that certainly one of the earliest distinct papers on the subject of astigmatism as causing headaches was written by Dr. William Thomson in 1879.¹ After this, papers began to multiply in the eighties; but long before the general medical public had the least idea of this valuable discovery, these two gentlemen (Drs. Thomson and Dyer) had obtained a clear and practical grasp of the facts in question.

So much for the history of this matter; it has become an old story.

Now, the every-day practitioner called upon to treat a neurosis, especially a headache, habitually refers the patient to an ophthalmologist, and does not know whence came this inestimable lesson. I can remember to have heard it laughed at as utterly absurd.

Before leaving the subject I should like to say a few words as to the more recent claims made by Drs. Stevens and Ranney. Men who run into extremes are often those who in the end teach proportioned wisdom to such as know wisely to profit by the excesses of others. This is going to be the case in regard to the extreme views enunciated by these two gentlemen. There is in them an element of occasionally useful

¹ The literature before this must have been meagre indeed. See American Medical Library Catalogue.

truth. Where they appear to me to have most distinctly failed I have endeavored to point out to the best of my ability.

At my clinic for two years or more Dr. G. E. de Schweinitz examined with the utmost care the eyes of all of the numerous choreic children who appeared at the Infirmary for Nervous Diseases. The cases extended to one hundred, and although many of them have been given the most careful attention, I do not think that any notable good in the way of cure of chorea was obtained by correction of refractive or other errors. In the disorder I first described as "habit-chorea" glasses have now and then been found to be useful, but not often; nor should we expect to find anything else in regard to chorea proper. It is largely a disorder of seasons, in the first place; and, secondly, it is a disease easy enough to treat. The great mass of cases get well without much difficulty; in a large number of instances the disease is self-limited, and prospers, even if let alone; nor has it the gravity which one would be led to expect from reading Dr. Stevens's early paper. Dr. de Schweinitz will, I am sure, entirely agree with the conclusions I have reached as being his opinion and mine, to the effect that we have gotten no good by correcting the eyes in cases of chorea. I came to this matter with a perfectly free and unbiased mind, but this was the end. Choreal children with ocular defects got well under arsenic alone quite as soon as others who had no like disorder of vision; or the choreas got well, and the hypermetropia remained unaltered and uncorrected.

And now as to epileptics I have met with no better fortune. As regards this, I have read with care the

conclusions of Stevens and Ranney, and wished I could have seen some of the epileptic persons whom they so successfully treated. Those who have seen much of epilepsy know that in some respects it is a very curious disease. If we take an obstinate epileptic case and put it suddenly under new conditions, in a new place, with altered diet and different surroundings, we occasionally find marked changes for the better, which are usually temporary. This is frequently the case at the Infirmary. When an habitual epileptic is admitted for the purpose of being watched, in order to determine the quality of the spasm, weeks and even months may pass without the patient having an attack, when before this they occurred every day; and this, too, despite the discontinuance of all drugs. I know of cases of men who had such attacks before entering the army, and who under the new surroundings were entirely freed from them. These are the things which make neurologists careful in concluding for the value of a new agent in this sad malady until the cure has lasted a long while, and been observed with care. Still, there are cases found in Ranney's last contribution (*Eye Treatment of Epileptics*. New York Medical Journal, January 13, 20, and 27, 1894) which seem to have ended in cures. I can only say that we have failed to obtain like results in our own attempts to cure epilepsy by the correction of very obvious refractive errors or by cutting tendons. I neither believe nor disbelieve. When I can see two or three cases of cure of undoubted epilepsy by tendon-clipping I shall want to recommence. So far I have had only disappointment, and others here who began to cut tendons with enthusiastic hope have, like me, got no good for their patients out of an industriously

acquired experience in this direction. I shall be but too happy to drop the dubious mood in which I am as to this whole matter.

I believe, as regards tenotomy *versus* prisms, that these surgeons have taught us a lesson which we may with moderation usefully employ. I have called your attention to the matter because I am well assured that if, as to tendon-cutting, the gentlemen whom I have so frankly criticised have gone too far, you, I think, have not gone far enough.

I have tried as to this whole matter to be fair and courteous, and yet to set the history right. As concerns too positive views of treatment, time alone will entirely settle these.

And now a word or two as to your own relations to the disorders in which we see ocular troubles, or as to those in which these are the cause of symptoms.

I trust the day has gone when you will put on prisms, or cut the tendons of ataxic cases without perceiving the spinal source of the defects; but a more lasting evil arises out of the fact that sometimes you do not comprehend the fact I have long tried to teach, that eye-strains lasting through the years of development may make permanent headaches which no glass will do more than partially relieve.

Again, you often see people who owe to ill health a suddenly intensified capacity to feel an eye-strain. You glass them and expect too much. Neither you nor any specialist can, or should, escape from a sense of larger responsibility; and if you cannot hold your patient when you have corrected the eyes, it is imperative that he learn from you the fact that he needs more than merely the best correction of the eyes. A careful study

would often tell you that a man may have two or three forms of headache, and that it were well to understand that while your glasses may cure an occipital ache, for instance, he may still continue to have neuralgic hemi-cranial pain, or an occasional attack of gouty headache.

I suspect that our own oculists are far in advance of the English and most Continental surgeons in the care which with they correct defects in refraction. I fancy that they sometimes fail to get the best possible results because of difficulties due, it may be, to personal peculiarities in patients, or sometimes to the belief that slight muscular defects may be let alone when the refraction has been accurately corrected.

CHAPTER XIV.

WRONG REFERENCE OF SENSATIONS OF PAIN.

IT occasionally happens that in the large clinical material seen at the hospital we meet with cases that are hardly capable of nosological classification, and yet are not without their lessons. Here, as an example, is a case so unusual that I have rarely seen one like it or even analogous to it. It is a very simple story :

CASE LXIII.—T. M. was sent to my clinic at the Infirmary for Nervous Diseases by Dr. J. H. McKee, on December 7, 1894. She was sixty-two years of age, born in Pennsylvania, and married. Her mother died at the age of ninety-five, and her father at seventy-three from “ cancer.” Two sisters and three brothers are well. One sister died of “ tuberculosis ” and one brother of “ spotted fever.” The woman has borne three sons ; two are well, and one is asthmatic. She takes two cups of strong tea and two of strong coffee daily, and beer moderately. The menopause occurred between forty and forty-five years of age. She has had pneumonia twice, once at fifty-two and again at fifty-seven years of age.

On November 25, 1894, thirteen days ago, while blacking a stove, she let a heavy stove-plate fall on the *right* foot, striking the toes. The great toe and the adjacent one were injured, and were discolored from the bruising. A line of blackish discoloration is still present under the nail of the second toe. But there is no swelling or redness, though some pain still persists.

Immediately on the reception of the injury she felt acute

pain on the antero-internal aspect of the *left* leg (the uninjured side) at the junction of the upper and middle thirds. This pain extended downward into the foot and upward into the thigh. It was of a burning character, fairly constant, but worse at night. At present the appetite is good and improving, the tongue is clean, there is no vomiting, but the woman has an occasional headache attended with nausea.

The heart's action is rhythmic, the sounds distinct. The vascular tension is moderately increased. The radial and temporal arteries are tortuous and resistant. There is slight vertigo, no dyspnœa, and no swelling of the feet. There is an increased frequency of micturition, both nocturnal and diurnal. The urine contains no albumin or sugar and has a specific gravity of 1022.

The woman has lost flesh in the last two weeks, because, as she states, of the severity of the pain. She has not had chills, fever, or sweats. She sleeps poorly, and worse since the accident. Memory is good and hearing is fairly good; but the eyesight is poor, although improved by glasses. The station is a little unsteady. The knee-jerks are active, and sensation is apparently normal. There is no history of traumatism of the left leg. The left tibia is particularly tender in the middle third, on the inner and outer margins. The left leg is also more florid and the temperature slightly higher. There is no inflammatory or other deposit present. An electric examination of the tibial group of muscles shows a slight quantitative decrease to the faradic current. There is no galvanic change.

On December 21, 1894, the woman was better, under the daily use of galvanism. On January 8, 1895, constant gain was reported.

I have personally gone over this case with extreme care, and see no cause to disbelieve the statement made by the patient. She declares that, having had a heavy

weight fall on the right foot, there was at once a pain in the left shin so sharp as to distract her attention from the quite severe injury received by the opposite member. Also she declares that the referred pain has now, for three weeks, survived that of the part hurt.

This case, unusual as it is, seems not to be unique. In fact, I came yesterday, in Sharkey on Epilepsy, upon a case in which the pain caused by an injection for gonorrhœa was felt as an acute pain on top of the head. I myself recall two of which I have personal knowledge. One was that of a man who, having a felon on the right thumb, had, until it was relieved, severe pain in the opposite thumb. The reference was to both thumbs, and not from a foot to a non-symmetric part of the opposite limb. In another case, in which an omnibus-window was let fall on a finger in which was a felon, there was with the pain of the finger a lasting and very violent pain in the face and neck of the other side.

I have also some remembrance of having many times heard during the great Civil War from men shot statements as to their having felt the wound as pain in some remote part of the body. In the notes of that time made by Morehouse, W. W. Keen, or by me, I find, in fact, interesting examples of the kind of referred pain seen in this woman.

One was the case of Captain now Admiral Stembel, who, being shot through the right side of the neck, had with reflex paralysis of the left arm also pain in that unwounded member. Other instances are as follows:

Case II. of Circular No. VI., 1864. A shell-wound of one leg (right) at once gave rise to burning pain in both feet and in the right arm and right pectoral region.

Case VI. A wound of the testicle was referred to the back, where alone was any pain felt.

Case V. A shell-wound of the outer side of the left thigh with immediate reference of pain to the same area on both thighs. The man thought, indeed, that he was shot through both thighs. Other of our cases exhibited similar phenomena of cross or symmetric or non-symmetric reference of the pain of a wound.

Case VI., in Hutchinson's series, p. 313, is one of injury of the median and ulnar nerves which gave rise to pain in the opposite hand. Pirogoff has a report of the same form of cross-reference from a wound. Such false reports as to the seat of pain-cause are not rare as regards the branches of a single nerve. A familiar example is seen or felt in the widely referred pain from an exposed dental nerve.

Our present case does not stand alone. Nevertheless, instances of unsymmetrical cross-reference are rare enough to make it worth while to call them to your attention.

One of my older friends, now dead, a naturalist of great distinction, had on one leg a small mole. If this was roughly rubbed or pinched, he had at once a sharp pain in his chin. More interesting are the cases in which after a nerve-section, or late in a neuritis, there is a reference centrad of touch at some lower point. I long ago described this class of facts, and not very successfully commented upon their cause. In his book on Remote Consequences of Nerve Injuries John K. Mitchell gives many illustrations of this form of referred touch-sense. He has also still more curious cases of sensations referred peripherad or to a remote region.

The unusualness of the present case lies in the continuance of pain in the remote region long after the seat of the originating cause had ceased to be painful.

I do not think that we are as yet prepared to reason upon some of these symptoms. I refer the curious to the book I have last mentioned. One can, in a measure, comprehend that a violent stimulus to a sensory nerve may be switched off on to other nerve-tracts or centres, as if it were the escape of an over-charge; but, even if we hazard such an hypothesis, it is still difficult to explain the persistency of certain of these transferred impressions, for it is a law of the receiving centres for painful impressions that when the cause of the pain ceases to be active the feeling of being hurt ends. But in some of these examples of false reference of pain there must have been made in a centre some more or less permanent change that continuously represents the effect to which any pain-making agency usually gives rise.

CHAPTER XV.

PSEUDOCYESIS: SPURIOUS 'PREGNANCY.

I HAD hoped to show you to-day a case which is of unusual interest and of the utmost rarity. The patient will, I think, come hither sooner or later, because she is convinced I am wrong as to her state, and because she believes that Professor Hirst, whom I shall ask to see her, will agree with her and disagree with me. Moreover, she is hysterical and inclined to exhibit herself. I shall not wait for her return, as it may never happen, but take her case as a text or an excuse for dwelling on a subject of interest to both the obstetrician and the neurologist.

I find it somewhat hard to fit her case and others like it with a label. If I call it simulation of pregnancy, that would be near to a satisfactory name; it would not fully satisfy me. As usual, I should have to qualify and explain it. Perhaps it were well to leave the matter until I have stated some illustrative examples. Before doing so I shall give an outline of the condition for which I claim your attention.

A woman, young, or it may be at the climacteric, eagerly desires a child, or is horribly afraid of becoming pregnant. The menses become slight in amount, irregular, and at last cease or not. Meanwhile the abdomen and breasts enlarge owing to rapid taking on of fat, and this is less visible elsewhere. There comes with this excess of fat the most profound conviction of

the fact of pregnancy. By and by the child is felt, the physician takes it for granted, and this goes on until the great diagnostician, Time, corrects the delusion. Then the fat disappears with remarkable speed and the reign of this singular simulation is at an end. When I describe one or two of these cases you will, I fancy, agree with me that the subject is worth discussing.

Perhaps the cases may be more frequent than I think they are. As a consultant I might rarely hear of them. The general physician and the obstetrician are more liable to encounter them, and yet they must be uncommon. Some years ago I asked Dr. Duer if he recalled the two or three cases of this nature sent to him by me. He said yes, and that he had also met with one or two others. Shortly after this I was consulted by a lady in regard to a woman of thirty years of age, a nurse in whom she was interested. This person had been married some three years to a very old man possessed of a considerable estate. He died, leaving his wife her legal share and the rest to distant cousins, unless the wife had a child. For two months before he died the woman, who was very anæmic, ceased to menstruate. She became sure that she was pregnant, and thereupon took on flesh at a rate and in a way which seemed to justify her belief. Her breasts and abdomen were the chief seats of this overgrowth. The menses did not return, her pallor increased; the child was felt, and every preparation made for delivery. At the eighth month a physician made an examination and assured her of the absence of pregnancy. A second medical opinion confirmed the first, and the tenth month found her of immense size and still positive as to her condition. At the twelfth month her menstrual flow returned, and she

became sure it was the early signal of labor. When it passed over, convinced of her error, she at once dropped weight at the rate of half a pound a day despite every effort to limit the rate of this remarkable loss. At the end of two months she had parted with fifty pounds and was on the whole less anæmic. At this stage I was consulted by letter, as the woman had become exceedingly hysterical.

Another instance I saw when in general practice. A lady who had several children and suffered much in her pregnancies, passed five years without becoming impregnated. Then she missed a period, and had as usual vomiting. She made some wild efforts to end her supposed pregnancy, and, failing, accepted her fate. Meanwhile she vomited up to the eighth month, and ate little. Nevertheless she took on fat so as to make the abdomen and breasts immense and to excite unusual attention.

No physician examined her until the supposed labor began, when, of course, the truth came out. She was pleased not to have another child, and in her case, as in all the others known to me, the fat lessened as soon as the mind was satisfied as to the non-existence of pregnancy. As I now recall the facts, this woman was not more than two months in getting rid of the excess of adipose tissue.

Dr. Hirst tells me he has met with cases of women taking on fat with cessation of the menses in which there was also a steady belief in the existence of pregnancy. He has not so followed up these cases as to know if in them the fat fell away with speed when once the patient was assured that no child existed within her. My much regretted friend Goodell's death de-

prived me of the detailed account of at least two examples having precisely the sequence of symptoms I have described.

These women are in no sense of unsound mind, nor is their illusion to be classified with the obstinate belief as to pregnancy held by some of the insane. These latter persons may be virgins or not. Sometimes the idea has arisen in connection with uterine symptoms, or else is the outcome of some exposure to the creation of pregnancy and alarm at a possible but non-existent pregnancy. Many of these people hold to the notion for years. Dr. Hirst recalls to me the story of Dupuytren, who, when consulted for such a case of eighteen years' duration (the patient was of the belief that she was going to have a son), advised the woman to swallow a private tutor. It is said to have cured the case, which I much doubt. I knew of one instance in which a physician etherized such a case, and assured the woman he had taken away a dead child. This answered for a week, and then she confided to him her regret that he had not taken away the other, as now she knew they were twins.

The delusion of pregnancy in the insane is neither created nor kept up of need by excess of flesh or failure of menstruation. No such food for fancy is needed. These cases defy the contradictions of time and the popular knowledge of physiology. On the other hand, the illusion of the patients I describe is inevitably destroyed by time and adverse circumstance.

I can find no mention anywhere in literature of cases precisely like those I have described. Perhaps I may have overlooked them or they might be found on more careful search. Yet, after inquiry of men with the large

experience of Goodell, Duer, and Hirst, I am forced to believe them exceptionally rare.

A woman is emotionally eager to have or not to have a child; one with the unsatisfied craving for motherhood, or one who has been fearfully tormented in her pregnancies—these, I think, are the classes of women liable to this complex group of symptoms. More rarely it is a woman long childless, who somewhat early and suddenly ceases to flow, and, as is not rare at the climacteric, puts on flesh very rapidly. The illusion of pregnancy is in such females a flattering one.

The other cases are the more interesting. The woman has naturally and too constantly dwelt with disappointed hope or abiding fear on the loss or delay of the periodic bleeding. Then she becomes more gladly sure or more alarmed, as the case may be, as she gains flesh and especially abdominal fat. Is this gain in flesh an accident of nutrition which combines, with lessened or absent menstruation, to give and sustain her growing illusion as to pregnancy? Women, as I long ago remarked in my book on Rest-treatment, are easier to fatten than men; also in them gain or loss of adipose tissue is more common than in the other sex, and less significant as to health or of pathological disaster. The point as to which I remain in doubt is as to whether belief in the presence of the pregnant condition in any way influences the really singular gain in fat seen in certain of these cases. Whether it is, as I said, coincident and assistant of belief, or whether it follows that mental state, I do not know. Some women thus deluded are, when once assured of pregnancy, likely to be careful to exercise less than usual, and acquire, like some pregnant women, excessive appetites. Also it is

quite sure that once they are convinced of their delusion they lose flesh very speedily, and this, too, may be in a measure due to a return to normal habits. Still there remains for us the unsolved problem of how much the mind has to do with the gain and loss of weight. The first of these cases I ever saw was brought to my knowledge in a singular way: A woman had given birth to two female children. Some years passed, and her desire for a boy was ungratified. Then she missed her flow once, and had thrice after this, as was customary with her when pregnant, a very small but regular loss. At the second month morning vomiting came on, and this too was usual. Meanwhile she grew very fat, and, as the growth was largely abdominal, she became easily sure of her condition. She was not my patient, but her husband consulted me as to his own morning sickness, which came with the first occurrence of this sign in his wife, as had been the case twice in her former pregnancies. I advised him to leave home, and this proved effectual. I learned later that the woman continued to gain flesh and be sick every morning until the seventh month. Then menstruation returned, an examination was made, and when sure that there was no possibility of her being pregnant she began to lose flesh, and within a few months regained her usual size.

The sympathetic vomiting of the husband is an interesting subject to which I called attention some years ago in my lectures on nervous maladies.

CHAPTER XVI.

HYSTERICAL CONTRACTURES.

THESE clinical lessons are, in a measure, the offspring of opportunity. The wards have, of late, given us cases of contracture that have been so interesting and so suggestive as to tempt me to call attention to their diagnosis and especially to their treatment. The subject is in no sense exhausted.

We do not know what hysteria is. So far, death has destroyed in all cases what evidence life might have offered as to its existence as an obvious thing capable of visual demonstration; and still we are apt, sometimes with too much confidence, to refer back its manifestations to this or that centre. Thus, it has been taken for granted that hysterical contracture is due to disorder somewhere present in such columns of the cord as are usually diseased in cases of spastic paralysis. The chief basis on which this opinion rests is this: Cases of long-continuing hysterical contracture have been seen to end in sclerotic alterations of the lateral columns of the spinal cord. The inference is that the precedent functional states were also due to the less visible hysterical conditions of these columns.¹ Moreover, it has been taken for granted that the state of contracture is analogous to the condition we find present in muscles rendered over-responsive by lateral sclerosis.

¹ Charcot: Soc. méd. des Hôpitaux, vol. ii., 2d series, p. 24,

I am not at all secure that these inferences are safe, or even that contracture is of a certainty due to spinal centres at all. It is quite possibly purely local and muscular as to origin; and, indeed, there are reasons why it is extremely difficult to consider it as of spinal birth, or in any way analogous to the state of excitability seen in disease of the lateral columns.

The history of contracture is briefly this: Under an influence, such as emotion, or from causes unknown, but usually in a frankly hysterical case, a group or groups of muscles contract abruptly or by degrees. These spasms may involve flexors or extensors, or both at once. They may affect one muscle or almost every group in all four extremities, and also the truncal muscles. The condition thus developed may last for days or years. The muscles concerned are not over-responsive to blows or to electricity. The skin-reflexes are normal or nearly so; the knee-jerk and ankle-jerk may not be in excess. Clonus is absent, or, if present, indecisive or brief, as we see it in hysteria or in over-excitability, weak people. The prolonged muscular action seems not to raise the local temperature. If you deeply anæsthetize the patient, the muscles relax, but not always nor fully except early in the case. An Esmarch bandage commonly gives rise to complete relaxation. In sleep some early cases relax; others do not. Very gentle effort in sleep to alter the angle of the limb may succeed, but the least abruptness of pull calls out a spastic response. Otherwise the spasm is usually constant, and efforts to overcome it forcibly give great pain. Very often there is loss of normal power in such muscles as are, and even in such muscles of the affected limb as are not, in a state of spasm. Usually there is

profound anæsthesia, confined to the disordered limbs or involving half the body.

I have said that the spasm is chronic, and this is the rule; but I have seen cases in which it came and went, or was seen only on alternate days. Quite often the flexors or extensors alone are contracted, but in the sad examples of general chronic spasm both sets of muscles are apt to suffer.

A contracture may last for years, and go as abruptly as it came—or, it is so said. I have never seen this happen, but I cannot doubt the positive statements made by others.

Under early reasonable treatment these spasms, if locally limited to single groups of muscles, are apt to get well. My own efforts to cure them with discs of metal, magnets, or by hypnotic suggestion have left me with mere histories of defeat. And yet under other treatments I often see these cases get well early. But this is not true of the more extensive contractures; in fact, the more extensive the region affected the more difficult the early treatment.

Now let us look at the graver form, that of *multiple contracture*. A patient far gone in the sad drama of hysteria has slowly, or abruptly, or after the part has been paralyzed and become insensible, a contracture of one limb, which gets worse. In a week or two the other limb suffers. Still later the remaining extremities become drawn up, and even the face, neck, belly, and thorax are involved. There are paralysis, surface-anæsthesia, and intense spasm. Pain is rare, unless called out by pressure or motion. Usually all the muscles suffer, but the attitude is commonly one of extreme flexion, either because of the greater power of the

flexors, or that they are the more excited. In some cases the limbs are in extreme spastic extension, or this is the case as to the legs, and not as to hands and arms. Very early in these cases the muscle-muscle-reflexes¹ are mechanically abolished or are pathologically interfered with; and later all reflexes may disappear in the disordered parts, and even direct response to a blow on the muscle be lost. There is apt to be diminished quantitative muscular response to faradic currents, and after years even galvanic responses may be lessened. The anæsthesia is of the surface, and is finally profound.

Sleep does not relax these cases after they have existed for some months. Great but uniform wasting is seen. The muscles harden. About the joints and between the tendons a similar but far greater leathern-like hardening is found. Ether or chloroform no longer causes relaxation; nor does an Esmarch bandage, or even section of the tendons, give rise to relaxation as in the local contracture.

This is a different symptom-group. If we ask ourselves, What has happened? What is the cause? we are at once face to face with a grave and interesting problem. Without a history we would be apt enough to consider such a case as one of anterior poliomyelitis. It is but a sketch of that malady; it is not a true picture. But suppose this patient bedridden for a score of years. I have seen such cases, in which the cold, absolutely anæsthetic limbs have lost all reflexes, and in which the shrunken muscles refuse to move under any form of electric current, save here and there to powerful gal-

¹ By these are meant the knee-jerks, etc.

vanic alternations. The picture of an anterior spinal malady *seems* then to be fairly complete.

This sad condition belongs only to the multiple contractures. It is never found in the single-limb spasm, no matter how lasting that may be. I have seen contracture of the extensors of one leg endure six years and show no sign of the peculiar permanent hardening which marks the second stage of some more generalized contractures. I recall one case in which for nine years the left gastrocnemial group remained in violent contracture. Then a section put an end to the spasm. To my surprise the muscle thus released from tension was soft and had not shrunk. In both of these cases, when under ether, the relaxed muscle behaved to electricity like a normal muscle.

All of this is unlike what happens in the contractures affecting two or more extremities. Here, even in the very early months, the muscles may begin to show a brawn-like hardness, which is a constant condition and not to be altered by anæsthetics. The muscle, at first spasmodically shortened, becomes organically set and stiffened. There is still and always more or less spasm, or at least this may be the case for years. It is also possible that joint-lesions due to long disuse and to subluxations may have finally their share in adding to this complex symptom-group the element of reflex muscular contractions.

You may have already inferred that I have become quite assured that there are two forms of hysterical contracture: one apt to be local and limited and not followed by organic muscular changes; the other apt to affect two or more limbs, and almost every muscle, even

of the trunk, and prone to result in the muscular and areolar tissue-changes already described.

I think it curious that while the early stage of general contracture is most difficult of cure, when the disease has caused organic changes and is in its second stage it is far less hard to deal with. Perhaps this may be due in part to the disappearance of active hysteria. Indeed it is often true that in certain old examples of contracture the symptom, contracture, exists no longer, and we have to deal only with the mischief of organically shortened muscles, altered joints, and sclerematous changes in the intermuscular spaces. The hysteria is lost with years; the spasm lessens or ceases; the consequences and additions remain.

I have said enough to enable you to separate this peculiar state from disease of the lateral or from that of the anterior gray columns of the cord. If, however, any other test be needed, it is to be found in the ease and speed with which under rubbing and faradic electricity these wasted muscles recover their characteristic excitability. With this return such reflex actions as had been mechanically obliterated again become visible, but the skin-reflexes remain absent until the anæsthesia passes away.

Richet divides contractures into painful and painless. I never saw a case of constantly painful contracture in America. Some of these cases, however, become painful for a reason not always present and which only of late has become clear to me. In general the painless contracture may be made painful by quite moderate efforts to overcome the contraction; and in old cases, such as I shall describe, the pain on movement is in the

joints and not in the muscles. In advanced cases of extreme contracture of the legs you meet now and then with examples of agonizing pain, apt to be referred to the feet and never seen in the arm. I had long considered this symptom as of spinal parentage. Some years ago, however, I was led in a seemingly hopeless case to suspect that the very great suffering present might be due to the stretching of the sciatic nerves at the notch and to a possible localized irritation or even neuritis. A number of tendons were cut and partial extension effected. Immediate relief followed and the pain continuously lessened as extension by instruments became more complete. Encouraged by this unlooked-for success, the case was attacked with larger hope, and in the end I had the pleasure of seeing a young and intelligent woman restored to a life of healthy usefulness. I happen to-day to have seen this woman; a strong, well-nourished, and apparently vigorous person. Looking back to the gnarled, blind, speechless patient of years ago, it seems a quite incredible rescue. Nothing except the rapid cure in this case shook my belief that very material organic change in the cord had taken place. So far as my own knowledge goes, post-hysterical sclerosis of the cord occurs only in generalized contracture, after ten or twenty years of life in bed. In one such case I saw, after death, a moderate, irregularly scattered sclerosis of the anterior columns and gray matter.

With such a symptom-group before us as I have already described as existing in old cases of multiple contracture, it is almost impossible for the inexperienced to disbelieve the presence of more or less organic fascial change in the cord. So difficult is it, indeed,

that I have often asked myself, if it may not be that organic lesions in hysterical people have a less serious hold on the tissues than such as come in the ordinary way, without precedent hysteria. Either we must accept some such conclusion, or else believe that the group of symptoms delineated may occur without having for their parents organic material lesions of central nerve-cell and fibre. I trust I make clear how difficult is this problem.

It is especially interesting to me just now, because I have in my care a young woman whose case is very like that I just now mentioned as fortunate. As our first illustration of contracture and of many of the most remarkable incidents of hysteria, I shall have read to you at length this strange story of disease. It is rare that a record has been kept with the care given to this one:

CASE LXIV.—E. M. H., of Arkansas, is a girl fifteen years of age, whose parents are in good health, and who has three brothers and sisters alive and well. The mother has had two miscarriages; one child was born prematurely, and one died of hydrocephalus at six months. A maternal aunt was insane.

The patient was born at term, without difficulty and without instruments, and proved to be a healthy and well-formed baby. She was breast-fed for six months; never had convulsions, and, although she had scarlet fever, her childhood was fairly healthy.

She learned to walk and talk early and well; was, in fact, a bright, intellectual child. Menstruation began at twelve years, and ceased a year before the girl came under observation.

In 1890 the patient had epidemic influenza, without remarkable consequences. The present trouble began in that year. Late in March of 1890 she was running along a wet

boardwalk, when she slipped at the end and fell, striking the back of her neck on the edge of the last board. She had to be assisted to rise, and complained of headache for several days. About a week later she tripped in the grass and fell, causing a green-stick fracture of the left radius. As soon as the nature of the accident was understood, a plaster-cast was put on the arm, and soon afterward it was observed that the hand had begun to "draw up," and that to extend it was extremely painful. This gave rise to no suspicion, but when the cast was taken off it was found that the arm and hand were entirely paralyzed, had no sensation, a very poor circulation, had shrunk perceptibly, and were blue and mottled.

The spine was examined, and is said to have been sensitive in the upper cervical region. The girl declared that tapping it at this time made the knees tremble and ache. She was ordered to bed, applications of ice made to the spine, and bromides and other medication employed. In a few days she became extremely nervous, flighty, and imaginative; had to have the room dark, obliged everybody to go about in slippers, and objected to the slightest noise.

Her physician concluded the trouble to be hysterical, ordered the shutters opened, and suggested that her parents insist upon an effort to move the hand. The child set her own will to work as soon as she was assured that it was possible, and in a few days was using the limb tolerably well, and was on her feet again, though weak. The hand still remained partially flexed, and rather uncertain in its movements for some time afterward.

Late in June she was taken to a farm in the country, where she steadily regained her strength and flesh, playing with other children, until the middle of July, when there were four excessively hot days. Although she was kept as quiet as could be, on the fourth day the left arm dropped helpless and began to contract, and later to shrink, and

became remarkably blue and mottled. Early next morning she staggered into her mother's room, complaining of dizziness. Her mother caught her in her arms, and from that time she has never stood erect upon her feet without aid. She was put in bed, and had a fever in a few days, with a temperature of from 101° to 102° . She was extremely excitable, and had a variable tendency to fancy shapes and sounds about her. Within a few days the temperature became normal. By and by she sat up and played, using both hands and arms freely, and could put out either foot to draw to her the playthings she dropped from her hands. Still she could not stand. Twice she forgot, and springing up to answer a call dropped instantly on the floor. After waiting for two weeks, thinking she would recover the use of her legs, her parents took her home to her own doctor. There was at this time an almost daily perceptible loss of power in the legs, and sensation also began to go, which had not happened before.

On October 1st, twenty-four days after the last fall, the child was without sensation below the knees. Her temperature averaged from time to time from 101° to 102° , with a very rapid pulse, and a slight return of the excitable, flighty condition. The former treatment was repeated, and again motion was restored in ten days. The hand at this time measured three-quarters of an inch less in circumference at the first joint than the other, and the skin peeled deeply from the ends of the fingers and thumbs, so as in a measure to suggest the kind of change that is seen after an attack of scarlet fever.

From this time on there was a steady gain until September 6th, when one day she lost her balance and fell backward off her seat, striking the back of her neck, a little to the right, at the base of the brain, on the sharp edge of a sill—not a door-sill, but a part of the frame of the barn where she had been taken for her amusement. The blow

raised a large lump, and was really severe. She fell doubled up between the step and the wall ; and the other children pulled her out rather violently, and she complained that they hurt her back in so doing. This was late in the forenoon. She ate no dinner that day, and looked pale and haggard, but said nothing about the matter. Very soon afterward it was observed that there was no motion in either feet or legs, and that the latter had begun to draw up ; but the arms and hands were still untouched by this disastrous trouble.

By October 15th the knees were at a slightly acute angle, and still drawing up. Any attempt at extension caused great pain. The girl was able to sit up, but complained that her back was constantly tired. Finally a rung was sawed out of her low chair in order to let the feet draw back under it. On October 19th, while sitting busily crocheting, her right hand fell suddenly in her lap, and a minute later the left, and neither moved again for twenty-seven months. In less than a week both arms had drawn up to a right-angle, the fingers and wrist were bent in flexion upon the arms, and both arms and legs were totally devoid of sensation. After this the child could not sit up any more, pain in the spine being constant at the lower part, chiefly in the dorso-lumbar region. The sphincter muscles of the bladder and rectum were at this time sometimes in a relaxed condition and allowed everything to pass, and at other times violently contracted, so as to make the discharge of urine or feces for the time impossible.

For days the little patient was an entirely helpless person, except for the ability to move her head from side to side. About November 11th chloroform was fully administered, but the tendons did not relax, and it required the efforts of two physicians to extend the arms and legs, so as partially to straighten the joints. Next day there was a decided change for the worse. Spasmodic contractions of

the neck and pectoral muscles set in. The girl could not swallow even liquids. Food was then given by injections for some days. It required an hour for her to relieve her bladder, and at this time the urine was heavily charged with phosphatic deposits, so that in a pint they were one or two inches deep.

All sorts of things happened in the next few weeks. The tongue was drawn to one side on occasions, so that the teeth rubbed the skin off it. The child became blind and nearly entirely deaf. The pectoral muscles occasionally contracted powerfully, so as to draw the arms across the chest, or the chest into a deep concave, making full breathing impossible. On other occasions the head was jerked violently from side to side, even in sleep, and the girl would rise from the pillow and move to and fro with a pendulum-like motion, and then fall back, still asleep, or apparently exhausted.

There were constant spasms of the diaphragm, during which it seemed that the child would never breathe again. Her temperature during this time varied from 95° to 101° , sometimes making this extreme excursus within two hours, the pulse being then from 130 to 180, and respirations beyond the possibility of counting. Meanwhile emaciation increased; sleep became almost impossible (even with copious doses of codein), seldom lasting more than from thirty to sixty minutes. At this time it was necessary to tie her head down to give her any rest at all. Ice was kept on the whole length of the spinal cord, an ice-cap was placed on the head, and in these measures the patient seemed to find more relief than in anything else. There was a broad red band across her forehead, very difficult to describe, and deep streaks down both her cheeks, of an intense red. Her eyelids sometimes remained open for long periods, and at others were shut for hours, so that she could not open them. Again, the eyes themselves

would move independently, sometimes one rolling upward and the other downward, or one outward and one inward, producing a most extraordinary appearance. "Every hour for weeks," said her mother, "we expected to see her draw her last breath; nor were we alone in the belief that it was impossible that she should come out of this condition and live." "I should have mentioned also," added her mother, "to withhold nothing of interest, that she passed entire days in a comatose condition, and others in a state that could more aptly be described as a deep sleep."

During this long period the girl was fed entirely by the bowel, and was rubbed with oil and brandy, the throat and mouth being sprayed with water and glycerol every few minutes. On December 16th came what is described by her parent as the crisis. She had alarming spasms of the diaphragm, much longer than the preceding ones. Then they suddenly ceased, and did not return for three years. There was a slight relaxation at this time of all of the contractions, and the patient was rather more comfortable. In a few days afterward she began to swallow a little, but at this time she was entirely blind; she had also no sense of taste. The smallest amount of water swallowed caused extreme pain, and the slight effort of masticating or swallowing food gave rise to profuse perspiration and indescribable weakness.

It was characteristic of the hysterical nature of the case that the girl could sometimes be fed by means of spoons which were of some unusual form, letting her feel the patterns with her lips or tongue. About this time she began to take potassium iodide, increasing the dose as fast as the stomach could bear it.

On January 9, 1891, she was able, with effort, to tell the number of fingers held up close to her eyes, and on January 16th could distinguish outlines and bright colors.

On March 1st her sight became good in the right eye;

it had never, until very lately, returned fully to the left eye. She could see things less distinctly with the latter.

Fearing the effect of heat upon her (as she manifestly lost ground when overheated; her legs drew up more forcibly, and she lost flesh as the warm days came on), her parents were advised to take her to the mountains for the stimulus of a rarer atmosphere and the coolness of the high altitude. A cot was made, which was swung on solid rubber rope to save jarring, and she was carried up Roan Mountain, 6394 feet high. She began at once to sleep well, eat well, and move with ease. At this time the hands were still twisted together at the wrists, and tightly clenched. She also had the embarrassing symptom of violent protrusion of the rectal mucous membrane, which would come down suddenly in her sleep. If it was not pushed into place at once, it seemed to be caught, and then it became congested, and its return was exceedingly difficult.

At this time the legs were still contracted and motionless; both knees were subdislocated; the left foot was laid up over the right thigh, and the right foot on the left thigh. Both feet were drawn into a sharp curve, and the toes were drawn under so tightly, and so close together, that it was impossible to draw a rag under or between them. Quantities of iron and potassium iodide were given, with occasional cessation of the treatment to let the stomach recover its tone.

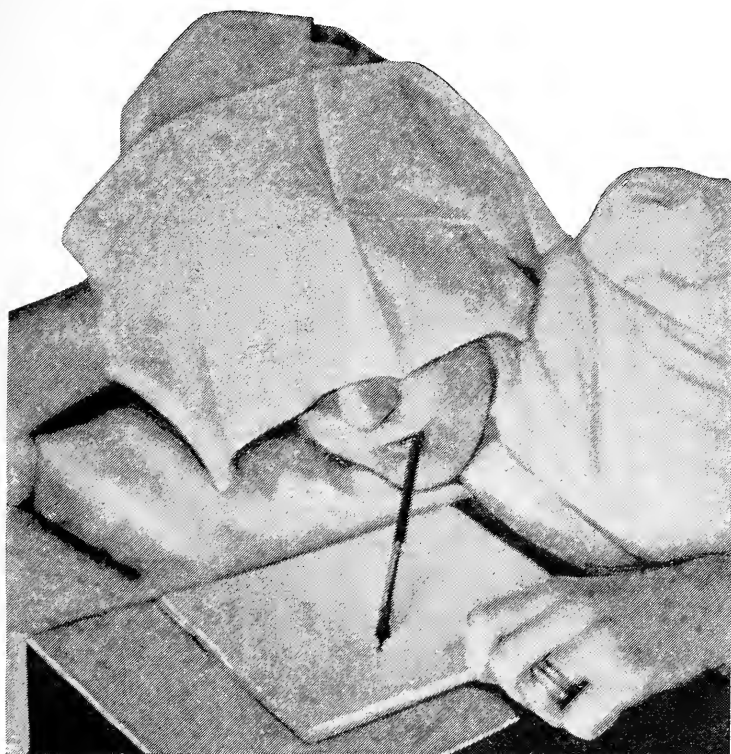
The child's parents remained on the mountain with her from June 6th to October 16th, and then returned to her native town. During these four months she had gained thirty-three pounds in weight, having weighed in June forty-five pounds and in October seventy-eight pounds. On her return she instantly ceased gaining flesh, was again attacked by influenza, and was wretchedly weak all winter; she had to be watched closely, and continually kept cool,

insisting upon the windows being open day and night, although the thermometer was often at zero. Her physician urged her parents to hasten away early in the spring, and accordingly they started in April, waited a month at the foot of Roan Mountain for the snow to melt, and moved over the mountain to Glen Ayres, 4500 feet above the sea-level, on the south slope. As before, the girl began to pick up at once. Sensation, which had crept down from the shoulders the previous summer nearly to the elbows, began to be manifest below the elbows.

In June, 1892, menstruation began. The girl was then twelve years and eight months old. There was no general disturbance of the system at this time, beyond slight backache and headache, and no hysterical manifestation. The menstruation continued with perfect regularity and in good quantity until December, 1893, when it ceased.

There has never been any unnatural discharge or any complaint of pain or uneasiness at the menstrual period, except that caused occasionally by retention of urine. There was a general access of strength and flesh during the summer of 1892, and in September the family moved again to the summit of the mountain for the winter, fully determined to test the value of altitude in the child's case. In the meanwhile, unable to use her hands, the little one learned to write and draw beautifully with pen and pencil in her mouth, holding them firmly on the right side between her teeth, and moving the head. She complained that the other side of her mouth was "left-handed." She conducted in this astonishing manner a large correspondence entirely by herself, except the folding of the letters and placing them in the envelopes, the hands being still clenched and twisted as I have described. Fig. 10 illustrates her mode of writing, and Fig. 11 the writing. I have since seen her write and draw with the pencil or pen held by the teeth as described.

FIG. 10.



E. M. H. writing with pen held in mouth.

FIG. 11.

He doesn't seem to be able to catch rabbits, or at least to keep them in the traps; one rabbit left its foot in the trap, another its tail, and another pulled its leg clear off in getting away.

I am getting better faster now than I have for a long time; I can move one of my thumbs when

With pen in teeth, 1892.

The winter was extremely severe on the mountains. During January it was impossible to keep the temperature in the sitting-room up to 32° . Most of the time it was from 20° to 30° . For some weeks previously the girl had been able to move her right thumb a little, and on January 13th she opened that hand and moved all the fingers, but could not separate the wrists, which, if I have made the matter clear, I should have described as being pressed violently one against the other.

January 15th, two days later, she opened the left hand and moved all the fingers, and got the hands apart. In a very few days afterward she was using them both for writing and knitting, somewhat awkwardly, of course. Sensation began to creep down below the elbows; her flesh increased rapidly, her color became good, and there was more warmth of the extremities. Her legs were still motionless, subluxated at the knees, and violently drawn, as before described.

FIG. 12.

The boys weighed me last
week, and I weigh eighty-
eight pounds. I had gained
~~ten~~ pounds since last July.
Enclose a little blue print
of myself. Ellen took it a
week or two ago. It is a very
good likeness, all but the chin.

With pen in right hand, March 19, 1893.

In April she was taken to Professor Allen, of Indianapolis, who cut the tendons in the groins and under the knees. The joints had grown out of shape, and the skin under the knees had contracted and hardened so much

after thirty-two months' flexion as to make full extension dangerous. A moderate amount of chloroform came near proving fatal, and so the cords were cut in four operations, whiskey being given beforehand. Then extension-braces were fitted to be worked with ratchets, and the patient was brought back to the mountain-top. She soon sat up in a wheeled chair, rolling it with her own hands, and, in fact, became a picture of rosy, plump girlhood.

In August, 1893, she began moving her feet slightly, and resolutely practised, with the aid of her mother, until, in October, she could move the sewing-machine treadle a little. She had to lift her legs and feet with her hands, but could move her feet and toes. There was still at this time no sensation in the legs below the groin, but it was pretty good in the arms, and she could feel a needle almost down to the knuckles of both hands. The knees had been forcibly extended daily by the use of instruments until the angle was extremely slight. This process was very painful, always giving rise to great distress in the lumbar vertebræ. Several attempts to stand with assistance caused extreme torment in the same region.

On September 30th the child was taken in a buckboard wagon several hundred yards, and again on October 29th.

On November 2d she appeared languid; her back hurt her more; she could not sit up, but preferred to lie still all day. She was carried down stairs as usual to lie on a couch, and the stretching at that time was omitted and never resumed. After this she did not sit up. Two weeks later there was a slight menstrual discharge; her appetite failed, and her strength gave way. For the first time in five months it was necessary to put ice-bags on the back of her neck. In other words, she had a very serious relapse.

She could not be carried down stairs until May. Her parents had intended to move to Roan Station for the winter, but did not think it advisable to disturb her.

Violent palpitation of the heart came on ; the pulse was 160, hard and bounding ; the temperature was only 97° ; the respiration very rapid. At this time the physicians who saw the girl were again satisfied that it was impossible that she could live much longer.

On January 12, 1894, she had serious ulcerations of the mouth and throat ; her breathing became as rapid as from 90 to 160 per minute ; her pulse quick, weak, and wiry. The urine was exceedingly scanty and dark. The legs became again motionless ; the cords contracted at the knees ; the hips and the arms were still free, as they had been before, but increasingly numb.

At this time there came on also a great difficulty in speech. Ice was now used on the head also, and again the child desired to have all light and sound excluded. On January 20th she spoke once : "Mamma," she said, "it hurts," and never afterward, up to the time of her falling under my own care. Nor, in fact, did she make in this period an articulate sound, asleep or awake. The vocal bands were relaxed at this time, and are said to have been ulcerated. The legs were drawn up almost to the body, but there never was as much contraction of the thigh on the pelvis as of the leg on the thigh.

The girl could still express herself in writing with her hands, but complained that they were weak and numb, and she feared, as she wrote, that they were "going again." On February 10th she had violent contraction of the abdominal muscles following an enema ; convulsive shudderings for a time ran over her body, and her hands and arms in an hour were completely paralyzed.

From February 10th till March 3d she had no discharge from her bowels. On February 14th she had great difficulty in expiration ; she would fill her chest to the utmost degree with air, and then remain half a minute without expelling it, and finally would drive it out in jerking whiffs, her head moving violently to and fro as she did so.

At this time there was great difficulty in deglutition, and occasionally swallowing was followed by violent convulsive efforts, during which the blood would fly forcibly from the nose and mouth. Two hours or more were required to swallow two or three ounces of milk, and nourishment was mainly given by enemata. At this time some effort was made to knead the abdomen, but every attempt caused contractions of the bowels so violent that the muscles would spring into stiff cords, and remain thus for hours; while the urine had to be drawn, and was brown and exceedingly offensive, but without blood.

On March 3d there was a temporary cessation of contractions, and the bowels were moved, and this was the last motion until March 29th. During all this time the patient was fed chiefly by enema; nothing passed away, everything being absorbed with astonishing ease.

After February 10th all communication was made by the eyelids; the child could no longer use her hands or her speech, even in the faintest whisper; but when she wished to indicate anything she would wink several times. Cards were held up containing the alphabet, and when the right letter was reached she would wink.

On March 12th continuous convulsions of the head, arms, bowels, jaws, and tongue set in. All food and drink were given by the bowel and by outward application. Again there was a deep crimson flush all over the head, and it was needful continuously to keep ice on the neck and head. The facial and temporal arteries were of the size of large lead-pencils; all were throbbing so violently that their pulsation could be counted across the room.

On March 22d the convulsions were so violent as to require men to hold the child, and at this time it was observed that the urine became of an extraordinary odor, described to be like that of the cat. On March 25th she was totally deaf, partially blind, and entirely speechless. She could

not feel a needle anywhere in the body, except in the lips. The skin was rough all over the body, and looked and felt like sand paper, presenting an indescribable dry roughness. At this time any attempt to comb the hair was followed by bleeding from the scalp, and the hair fell out in handfuls. Emaciation became extreme. All of this time the girl had an exceeding sensitiveness as to heat, and the breathing would become terribly difficult if the windows were closed, so that her family were obliged to keep the sash up and the transom over the door open although they were on the top of the mountain, with the thermometer down in the neighborhood of zero. Her nurses, as may be imagined, suffered severely under this *régime*.

On March 29th her convulsions ceased. On April 4th she had discharges of green and yellow pus, in remarkable quantities, from the ears and nose, as well as from one or two abscesses which had to be opened in various parts of the body; one on the side of the neck appeared to be very serious. Shortly after this her sight began to return, and it was soon found that she was reading the motions of her attendant's lips, although stone-deaf, and very soon she understood every syllable, when the light was good and faces were turned squarely toward her. From this time for months she continued to improve in this accomplishment. Her family learned for her use the deaf-and-dumb alphabet, so that she communicated with them either by speaking with her own lips, so that her mother read them, or by looking at the lips of those talking, or by seeing the motion of her mother's fingers, when her sight at length was better. Following this there was a period of many months during which she was subject to curious and frequent attacks of congestion of the superficial veins all over the body. The whole body would sometimes become mottled blue, as if a coarse blue veil were drawn over it; the lips and eyelids would grow almost black, and breathing

become exceedingly difficult. It was then necessary to give stimulus quickly, and to sponge the body with cold and hot water, and renew the hot-water bottles, and do quick work, in order, as it seemed to her family, to save the child from death. A little excitement, or a too warm room, would in a minute bring on one of these remarkable attacks. The last attack of this sort occurred in September.

Early in May she began to chew a little; she could swallow no solids, and only from one-eighth to one-fifth of the fluids attempted; the diet was still chiefly by enema. On May 2d Dr. Allen, who saw her, expressed his surprise that she was still alive, and it did not seem possible then that she could live from hour to hour, although she had been really convalescing for nearly a month. She was breathing entirely with the diaphragm at this time; the lungs were congested and full of râles, and in the costal region quite motionless.

From this time there were gradual gains, and it seems useless to repeat the roll of extraordinary hysterical symptoms. Early in June she began moving the fingers of the left hand. On June 13th she was able to "shake hands all around," as she said, and could swallow a little solid food, and nearly all liquids. On June 19th she wrote her name for Dr. Allen and for her mother, and respiration began to be deeper and more comfortable, and she was more cheerful and happy. On September 13th she was moved down to Roan Station, 2650 feet above sea-level. On September 28th, the third consecutive warm day, the mercury being at 80°, a violent inflammation of the eyeballs and eyelids and congestion of the entire face and neck came on, and lasted until the weather changed, a week later. At this time the child began to make her right hand hold the work for her left hand. The left hand and arm were quite free and vigorous, although there was no feeling as yet in any part of them.

Every warm day in October and November brought back symptoms similar to those already described, but the prompt use of cold applications stopped the attacks.

On November 26, 1894, four years and three months after the second injury, and four years and nearly eight months after the first injury on the boardwalk, and thirteen months after the last relapse, the sight was good in the right eye; dim in the left eye. The ear-drums were said to be congested, but she distinguished many sounds through a trumpet, if one spoke loudly. Often she could not distinguish both syllables of a two-syllable word, not even her own name. After the first efforts her deafness again seemed to increase. At this time she heard rather better on cold days than on warm days. High-pitched voices hurt her.

FIG. 13.

*"had never seen him. But I with a funny fat
looking little man? What do you suppose
Lemmy's profile reminded me of? The con-
stitutional face of Christ!— Of course not my
idea of His face. Did it ever occur to you
that the pictures of Lemmy and Christ
were alike? You just notice.*

With pen in left hand, November, 1894.

On examination of the ears no perforation of the drums was found, in spite of the free discharge from the ears. Inflation of the Eustachian tubes was attempted, but could not be borne. No effort at articulation was possible. Comparatively little food could be taken, but it was swallowed more freely, and some food was still given by injection.

Although there was a gradual gain in flesh and strength, sensation returned late in both arms above the elbows. The right hand recovered its motion and held the work so

as to enable her to use the needle with her left hand ; or else she would hold the pen in the right hand for writing, and guide the less active part with the left hand, seizing it at the wrist.

The limbs remained unchanged, the feet crossed and drawn. The patient lay nearly all the time at this period on the right side, and could not bear lying on the spine at all. There were a great many râles in the right lung, and what was described as emphysema and congestion, but the pulmonary condition was better than a month before. The temperature was usually half a degree above normal ; the pulse always a hundred or more, and easily increased. The girl at this time could not bear a temperature of over 60°, whether natural or artificial, and had to have plenty of air. The stomach could not hold much food at a time ; efforts to feed her produced contraction and pain and a threat of return of bad symptoms. The bowels were only moved by copious enemata ; the discharges were slow and difficult, by reason of weakness. A good deal of mucus passed, frequently in large shreds. The bladder was subject to involuntary and frequent passages. The child was aware when these would begin, and could sometimes, though not often, start them, but could not stop them. The skin had become natural in texture and of a good color. There had been no bedsores recently ; there had been one on the head in March, but it had healed up very readily. The right ear, I should say, had a large piece worn out of the rim—a deep notch caused by the jerking of the head on the pillow in February and March of the year before. This had long since healed. The spine was very tender ; the child could not bear to have it touched ; the muscles alongside of it were also very sensitive.

The mother added that at this time the girl was fifteen years of age ; that she had grown symmetrically in the main ; that if she ever walked she would not be noticed as

under-developed anywhere. The feet were rather small, but not deformed; and the hands, like the feet, were of good shape. The child's mind was phenomenally clear and keen, her memory inexhaustible, and her patience very great. Her intelligence, as her mother said, was almost clairvoyant.

In December, 1894, this child was brought to me: a bright, exceedingly intelligent, very pretty girl, less thin about the face than elsewhere, and sufficiently developed for her time of life. There was general emaciation, which was most marked in the right arm; her weight at this time was about sixty pounds. There was great contraction of the legs upon the thighs, so that the heels lay up against the buttocks, and the feet were crossed, one ankle over the other. The contraction of the thighs upon the pelvis was not much beyond a right-angle. The knees were closely drawn together. It was impossible forcibly to straighten the legs, even after complete use of chloroform, and the joints were secondarily affected, the knees partially luxated. The skin of the limbs about the ankles and knees was thickened, shining, and smooth, and behind the knee was excessively hard and tough, as though there was infiltration of the areolar tissues, it being difficult to feel the tendons distinctly. The temperature of the legs was good above the knees, but the feet were exceedingly cold, although there was nothing remarkable about the nutrition of the nails, either in the feet or hands. The cutaneous, muscular, and tendinous reflexes were all absent, and pins could be stuck in anywhere below the hips without evidence of pain. Neither was there any thermal sense below the groin or in the right arm.

Over and above the contraction in the muscles there appeared to be also a true paralysis of motion below the knee, as the child was incapable of making the slightest exhibition of movement of the toes or ankles. She could

lift and hold both arms up from the bed. She could not grasp anything with either hand, but with a little management and support could hold a book. There was incomplete loss of power in the upper limbs to localize a touch or to detect extremes of heat and cold. Pain was here unfelt, and there was analgesia over the whole trunk. The biceps tendon-jerk and the muscle-jerk of the extensors of the hand were, however, present. Respiration was normal, about eighteen to the minute; the heart lungs, and bowels were natural; there was no evidence of organic disease in the abdomen or elsewhere; the urine was normal. The sight was good at this time; the pupils were equal, moderately dilated, and reacted well to light and in accommodation.

FIG. 14.

one of I rings looks I have ever
 read. Miss Patchiff is read-
 ing one of Miss Jewett's looks
 to me - 'The Country Doctor.'
 It's a very pretty story - one
 that doesn't need any thinking
 to understand.

With pen in right hand, guided by left hand, March, 1895.

The child declared that she was absolutely deaf, and made no attempt to speak. She read her mother's lips with ease, and mine with more difficulty, explaining that it was on account of the moustache which hides the lips.

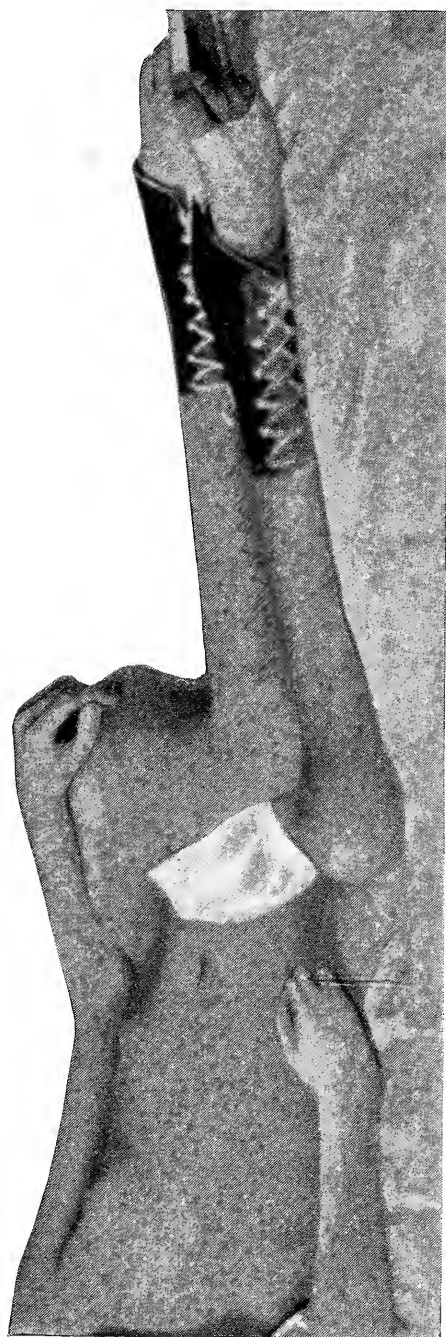
Dr. Archibald G. Thomson examined the eyes and ears,

FIG. 15.



E. M. H. Attitude before treatment.

FIG. 16.



E. M. H. Attitude after fifteen days' treatment.

and reported as follows: O. D. The media are clear; the pupil clear and reacting normally. The disc is normal and color good, with a small central cup. The vessels and the fundus are normal, 4-1, with astigmatism. The fields for form and color are normal. O. S. The same as the right, except that the astigmatism is a little higher. The muscular balance is slight. Exophoria due to weakness of internal rectus. There is no perforation of the tympanic membrane or other gross lesion of the ears.

This child remained at rest in bed on her side always. To be on the back caused lumbar ache. Before attempting any more serious step I endeavored to see how much movement I could get in the legs by the continuous use of massage and faradic electricity. Very soon I found that there was a slight increase of sensation everywhere; that the limbs were beginning again to grow; that they could be drawn down each day a little lower; and that the temperature of the feet increased. After a few weeks of this treatment we ceased to gain any further power of passive extension of the limbs, and it became obvious to me that, however reluctantly, I must resort to surgical interference.

Meanwhile her deafness interested me greatly. It became rapidly well in a few weeks. Speech came back with nearly as great speed, so that within two months after she fell into my hands she could speak perfectly well, could hear entirely well, could see as well as ever, and was recovering pretty rapidly the use of the left arm and more slowly of the right. She had made also the great gain in motion and sensation in the lower limbs above the ankles.

At this time I requested Dr. Keen to make section of the tendons of the leg, one at a time, and this was done with great difficulty under profound etherization; partial straightening of the leg was accomplished then with weights and apparatus, but not with the ratchet. There has been a gradual extension of the left leg, and it seems

likely that it will continue to improve, although the previous history prepared me to see at any time some return of hysterical phenomena.

On April 26, 1895, the left leg was so much better that Dr. Keen thought it would be well to operate on the right leg. Sections of the tendons at the knee were made, but it was found that the head of the tibia was so luxated posteriorly as to render impossible such extension as had been effected on the opposite side. After a time a suitable apparatus may overcome this unfortunate mechanical difficulty; but much will depend on her endurance, and the gain to be hoped for from massage and electric stimulation.

Of the drawings, Fig. 15 represents the attitude of the child when she first came under my care; Fig. 16 the results obtained by massage and electricity and slight extension by weights, up to the date of operation; and Fig. 10 the position in which she placed herself when using her pencil or pen with her mouth. I also add *fac-similes* of parts of letters written with her hands and with the mouth (Figs. 11, 12, 13, 14).

As a clinical lesson in hysteria, nothing could be more instructive than this record. I have little doubt that early isolation and resolute treatment would have saved these years of distress. Before we pass on to consider the gravest symptom—the general contractures—I desire to call your attention to the fact of the absence of changes in the fields for color and form—surely an amazing thing in a case with so much anæsthesia. Unlike the case first spoken of, the wasted leg-muscles, especially the flexors, can be stimulated by faradic currents; but the current that moves them so slightly is one that I cannot endure, and that painfully cramps any of my muscles on which I test it. Electro-muscular

sensibility is very much lessened. Those muscles of the limbs that are made tense by long contraction of their opponents scarcely stir at all with the utmost power of a battery, but when I relax them somewhat by forcible extension of the limb the extensors thus relaxed move better under faradic excitation. This corresponds with the observations reported long ago by Morris J. Lewis and myself to the effect that forcibly stretched muscles not only move badly under electricity, but also do not feel it as keenly.

Had not these muscles been once weakened by tendon-section and their sequent elongation I should have begun by cutting them. I felt that to cut these tendons again might result in further additions to their lengths and that I should run great risk of seriously disabling their strength. Nevertheless I was forced to take this risk. In a long experience with hysterical contracture I have never before come face to face with this difficulty. Of course, there is always the after-resource of shortening the tendons.

Seeing how great is the power with which the muscle in a state of spasm contracts, I used to fear that its retraction after surgical section of tendons would be excessive. It is not so. Rather does the sudden cessation of tension appear to put the muscle at rest, as though the resistance were one of the means of keeping up the pull made by the muscle. I have, in fact, lost the fear I once had as to section of hysterical muscles or their tendons.

In the case of Miss C., of which I have already spoken, there was extreme pain in the feet. In another case, to be presently described, there was a like torment. In the one just now related there has been little

or none. The reason is clear, I think: while the flexion at the knee is in this latter case extreme, that of the thigh on the trunk is not. In Miss C.'s case not only were the knee-joints at the utmost angle of acuteness possible, but the knees touched the chin, as was nearly the case in the man in Scott Ward, of whom I shall have more to say by-and-by. Now flexion at the knee only relaxes the sciatic nerve, but extreme flexion of the thigh on the trunk keeps the nerve tightly drawn over the edge of the notch, and may well be—indeed was, I am sure—the chief cause of pain in two of the cases referred to. In both, tendon-section and even partial extension of the limb speedily put an end to the pain in question. In my last case the absence of pain is, I think, due to the lack of extreme flexion of the thigh on the trunk.

There are other interesting features in this case with which I can deal but lightly. One was the rare symptom hysterical deafness. It was complete; nor did the most unexpected and violent sounds enable me to detect the patient in simulation. With the use of Malony's ear-tubes she soon began to hear a little, and with her general gain the deafness speedily departed. I should not, above all, forget to say that for the first time in her history she was isolated from her relatives.

January 14, 1896. From May, 1895, the patient was absent in the country until September, and since then has been in the care of Dr. J. K. Mitchell. Her weight has increased seventeen pounds. She has lost the indescribable look of watchfulness so familiar in these cases. Her will-power is better; she has new interests, and insists hopefully on her power to get well. Her condition was at this time as follows:

She sits in a wheel-chair, which she moves with ease. She is rosy and in good condition, and weighs 101 pounds. Her hand-movements are perfect. The legs are better than ever, and every movement is possible, although some muscles move less well than others. The reflexes are all present and the knee-jerk and ankle-jerk are present; all nerves transmit currents normally with faradic or synsoidal currents; the leg-muscles show slight quantitative lessening of response. The legs are still flexed on the thighs, but the angle thus made is becoming wider. The feet still drop a little, but the toes have perfect flexion and extension. Sensation is nearly perfect in all its forms. Red blood-corpuscles, 4,200,000. Hæmoglobin, .90 +. Urine normal. The Roentgen rays gave an encouraging picture of improvement in the partially luxated knee.

On January 15th Prof. Keen stretched the legs under ether, and with such good results that in a week she was able to stand on crutches, and unaided to walk a few steps.

I think we may now feel assured that, if no intercurrent accident occurs, this patient will regain such health of mind and body as will repeat the extraordinary results of the very similar case of Miss C., already alluded to, and more fully recorded in my Lectures on the Nervous Diseases of Women.

I have thought it well to give unusually ample notes of this later record of hysteria. No more instructive lesson can be given as to the need for hopeful, persevering treatment in a case of what did seem at first beyond all human aid.

CHAPTER XVII.

HYSTERICAL CONTRACTURES (*Continued*).

I DISMISSED last week a case of contracture in which the legs were in extension. I read you the notes as an interesting contrast to the flexor-spasms just described. I like also to speak of this case because it illustrates one very rational way of dealing with a partially developed hysteria, for really, despite a long history, it was undeveloped. A year or so more at home would have given us another bed-case.

CASE LXV.—Annie P., unmarried, white, seventeen years of age, was sent to me for treatment, and was admitted to the Infirmary November 3, 1894. The family history was negative. She had four brothers and five sisters who were living and well. The patient was a small child at birth, but always enjoyed good health. She had the ordinary diseases of childhood, and a mild typhoid fever and attacks of influenza in 1890, 1891, and May, 1892. After partial recovery from the last attack she suddenly began to suffer from pain in the right heel and the arch of the foot, with a feeling as of a “large stone in the shoe.” Hot water gave relief. The pain returned, and was now better and again worse. The heel, and indeed the whole foot, and later the calf and the outer side of the thigh, became very sensitive to touch, and were also the seat of much spontaneous pain. Later, pain appeared in the left heel and spread similarly.

About one year after the first attack the girl was suddenly seized with acute and severe pain in the sacrum,

which soon affected the whole spine. Motion of the arms and legs, she said, made the pain worse. She now took to her bed (May, 1893). Soon afterward she became rigid, with the arms spread out laterally, the head retracted, and the legs extended. Pain was then severe in all the extremities, but not alone in the shortened muscles. It gradually grew less toward evening, but the rigidity continued. The patient was never unconscious. During the summer of 1893 she recovered sufficiently to walk a little, but she still had great back-pain and frequent relapses.

In October, 1893, after walking "too far," she was given a hot bath. When taken out she fainted and had "heart-failure," and frequent trouble with her heart afterward. She was almost constantly on a bed or sofa from that time, and had occasional attacks of asthma during the year before coming under observation. Menstruation, regular and painless before the present trouble, was still fairly regular, but the flow was very dark and offensive, though quite free. Otherwise there were no signs of disease of the genito-urinary organs. The appetite was fair, considering the very long confinement. Digestion was good. The bowels were costive.

Examination showed a slightly built, anæmic-looking girl, weighing eighty-three pounds. She was very much emaciated, especially in the legs. The growth of hair was unusual and excessive for her age and sex, all over the body as well as on the head. The skin was in good order, and the nails smooth and well formed. All touch anywhere on the legs and feet was painful, especially on the inner aspects. This sensitiveness varied from time to time. A slight touch was painful; pressure excessively so. The nerve-trunks seemed no more tender than the muscles. Two points were nowhere distinguished as such on the feet at less than an inch and a half, and at a slightly less distance on the legs. The temperature-sense was normal. The abdomen was not

sensitive, and there were no hysterogenic areas in the ovarian regions, nor any typical disturbance of the color-fields.

The girl was without pain in the arms. There was apparently a slight thickening about the spinous processes in the lower dorsal region, and the processes were excessively sensitive. The whole spine and the gutter on both sides for a distance of an inch and a half or two inches was very tender, with areas of exquisite hypersensitiveness between the shoulders, at the waist, and over the whole sacrum. Firm pressure with the palm of the hand over the sacrum was less painful than touch. Use of the arms, she said, increased the spinal pain and tenderness. The knee-jerk was slightly increased, and easily reinforcible by motion, sensation, and emotional excitement. There was no clonus. Elsewhere the muscular and all other reflexes were normal. A presystolic murmur was heard at the base of the heart and along the left side of the sternum, and faintly in the axilla and at the apex. The pulse, which was soft and wanting in fulness and force, varied from 100 to 120. Respiration varied from 30 to 50. The blood-count was 2,500,000; the color 75 per cent.

It is rare to see so great sensitiveness to touch as Miss P. exhibited, and still more rare to find the muscular tissue sensitive. As to contracture, the condition found was rare and curious. The extensors and flexors of the lower limbs all felt firm, but the result of this general contraction was rigid stiffening of both legs in extension. The feet were less remarkably stiffened than the legs. The arms were no longer in a state of contracture. All efforts to flex and, after flexion, to extend the legs met with that continuous yielding resistance common in spastic states, and to which long ago I gave the name of "lead-pipe" symptom.

At my second visit I ordered the girl to walk, and, despite her disbelief in her power to obey, she was able with small help to get up and take a dozen steps, during which the heels did not touch the floor. Two years on bed or couch made this exertion difficult. Having once given her reason for hope, I put her back in bed, and for two weeks forbade exercise, while massage, tonics, and good diet were employed. She gained rapidly in flesh. The corpuscular blood-count doubled after a week of massage;¹ all the functions began to resume their orderly action. She was then allowed as a favor to rise and walk, and two weeks later was able to go home in excellent condition.

In the present case I began by insisting that this bedridden girl should walk. I showed her that she could do so, and promised her that the pains in the back and leg would leave as she grew more and more able to exercise. Had I failed as to my predictions I should have doubly injured the case, but when one has had a long experience with hysteria it is easy to select the cases for abrupt exercise of authoritative influence. There were doubts and tears, but she walked, as ordered.

There is much to dwell upon in the several cases I have brought before you. But now it is, above all, the prognosis and treatment to which I desire to call attention. Charcot has said that very marked decrease of faradic contractility ought to make us suppose that the spinal cord has been invaded, and that the existence of a spinal organic lesion of more or less gravity will be placed almost beyond doubt, if, under the influence of

¹ See paper by John K. Mitchell on the Influence of Massage on the Blood-count *American Journal of the Medical Sciences*, 1894.

deep sleep induced by chloroform, rigidity of the members only gives way slowly, or even persists to any marked extent, or if with this the faradic reactions are greatly lessened.

You will have seen that I do not altogether agree with this great student of disease, and that I approach these cases in a far more hopeful mood than I could do if I accepted the despair which his dictum would bring.

The treatment need hardly be set forth in detail. Above all, get your hysteric patient away from her audience. A hospital-ward is no place for her. But if you cannot deal with her elsewhere, treat the case as commonplace or trivial, and call no attention to it. For the rest, all the toning means are of use, and there are moral tonics not to be neglected, but for which a prosperous hour must be chosen.

It is well to say that the more you can improve the nutrition of joint, muscle, and nerve by mechanical and electric tonics, the better will be your chances of success when at last section of tendons becomes desirable.

I have put aside a final case of contracture in the male because of the doubts I long entertained as to its origin.

CASE LXVI.—W. H. G., aged thirty-three years, an unmarried railroad-clerk, was sent to me by Dr. W. S. Beebe, of Kirkwood, N. Y. Dr. J. E. Talley has made the following notes of his case: The man's father is living and well. His mother died of typhoid fever at fifty-seven years of age. He has one sister, in good health. There are no known family diseases worthy of record. The patient himself had the ordinary diseases of childhood, excepting

scarlet fever. He had pneumonia at nine years of age. He never drank to excess, nor has he ever abused the tobacco-habit. He certainly has had no syphilis.

The series of ailments that ended in what you see began with bronchitis in 1890. His physician said that at the time he was run down from overwork, and ordered him to take a vacation. He went away for two months and returned to his desk feeling much better. After working for a month, he was on November 6, 1890, "seized with chills," and had three in succession. After this he was confined to bed for fourteen weeks, suffering from what was described as "nervous prostration." He is said to have also had some bronchitis. It was not until five months later (April, 1891) that he was out of bed permanently, and able to walk with the aid of two canes. He was unsteady on closing his eyes and when trying to stand or walk in the dark. At this time, he tells us, the knee-jerk was present, and this is probable, as the patient is very intelligent and has studied his symptoms assiduously.

During 1891 he got much better, and walked without a cane, except when going a long distance. He still continued to cough more or less.

In March, 1892, he felt well enough to go down to El Paso, Texas, to take charge of an office. There he lost his cough, gained in weight, and was doing very well until August, 1893, when a "very dear" friend and fellow-worker died of hæmoptysis. The shock of this loss, coupled with extra work, seemed to be too much for him, and again he began to fail, and to become on the least occasion emotional even to tears.

From September 1, 1893, he had pains in his feet, which continued until December, 1893, when he took a mustard foot-bath for their relief. On the following morning he awoke to find his legs drawn up at the knees, just as they were when he came to me for treatment on March 15, 1894.

The thighs were rigidly drawn up so as to touch the abdomen. There was also spastic adduction of both thighs and of the legs and flexion of the feet. The contractions continued to become more complete and more rigid. As to sensation at this time the man can tell us as to this nothing of value.

On admission to the Infirmary the contracted and symmetrically wasted state of the lower limbs described was very apparent. The right foot was flexed firmly against the buttock, a forcible pull on the foot being required to separate the heel from the buttock. The left foot and leg were in the same position, except that the heel could be separated from the buttock a distance of a foot and a half by force. The hamstring tendons on both sides were very rigid, as were also the muscles of the thigh and leg on both sides. He could move the toes of both feet fairly well, but flexion and extension at the ankles were limited, every muscle being rigid.

The patient said that the wasting of the limbs was really not great, as he had always been very thin. The circumference at the middle of the right thigh was 35 cm., of the left 35½ cm., at the middle of the legs on both sides 10 cm. The whole body was extremely emaciated. The hands showed notable wasting of the interossei muscles and of the thenar and hypothenar eminences. There was no clubbing of the fingers. The dynamometer registered 55 in either hand. The spinal column showed nothing abnormal. There were scars of previous cauterization.

Sensation was everywhere normal until we examined the feet. In the left foot sensation as to touch, pain, and temperature was absent on the whole dorsum, the anterior third of the sole, and the heel. The mid-region recognized touch. On the right foot there was an absence of sensation on the first, fourth, and fifth toes; touch was felt in the third and fourth toes on both surfaces; also on the dorsum and on

the sole generally, except at the heel. It was nowhere normal on either foot, but improved above the ankle until at mid-leg it seemed perfect.

These facts are interesting, because there is no account of early loss of feeling. It seems certain, however, that this anæsthesia must have been an early symptom. The overwhelming pain appears to have turned attention from the merely negative sign, loss of tactile sensation.

Pain had been felt in the legs before contraction came on, but was never severe, and was taken to be rheumatism. The pain which came after the contractions had lasted fifteen days was more severe and of a different character. It grew to be at last the absorbing feature of the case.

There have been no bedsores or evidences of grave trophic disorder. Co-ordination was good in the arms and fingers. Station and gait, of course, were not obtainable, the man being bedridden, nervous, and very emotional.

The knee-jerk was not obtainable, nor could we get ankle-clonus or muscle-jerks in the legs. The epigastric, abdominal, and cremasteric reflexes appeared to be normal, as was also the elbow-jerk. The man has never had incontinence of urine. He has had no priapism; and, in fact, very seldom has an erection. He has had throughout perfect control over the rectum.

Dr. Archibald G. Thomson reported upon the eyes: "The pupils are equal and dilated. They react in accommodation, but not to light. The media are clear. The discs are a trifle grayish, the arteries small. The fundus is pale. The muscular balance is good. There is no reversal or contraction of the color-fields."

With the man on his back the chest-expansion was $1\frac{1}{2}$ inches. The percussion-note was higher-pitched above the

right than above the left clavicle, and a full inspiration heightened the pitch on the right side and but very little on the left. The whole right side moved less than the left. Respiration was a trifle harsh at the left apex, and expiration was here prolonged and more marked than inspiration, but of about the same pitch as elsewhere. There was very little change in vocal fremitus and resonance on the left side, but on the right chest anteriorly the voice was conveyed much more clearly than elsewhere. On full inspiration there were moist rhonchi at both apices, more marked on the right. Posteriorly the eleventh rib on the left showed a prominence, as if it had been broken.

On having the patient sit up it was observed that the left nipple was slightly higher than the right. The right chest moved more ($\frac{1}{2}$ inch) than the left during respiration. A musical murmur, systolic in time, was heard at the end of expiration over the base and at the apex of the heart. The apex-beat was found to be in the fourth interspace, with the greatest impulse at the sterno-costal junction.

Staining the sputum for tubercle-bacilli was negative; uranalysis also was negative. The temperatures were rarely over the normal line.

It was evident that the lung-condition had nothing to do with the paralysis. There was much difference of opinion as to the cause of these very interesting contractures. The absence of a more distinct previous hysterical history led some of our staff to regard the case as possibly one of spinal hemorrhage.

As to treatment I had no indecision. The great flexion of the thigh on the pelvis, as in Miss C.'s case, kept the sciatic nerve stretched at the notch. There was but one remedy. As to what more we should win beside relief from pain I could not anticipate.

At my desire, on March 29, 1894, Dr. W. W. Keen operated on the right leg, dividing the thigh-muscles at their attachments to the pelvis; also the inner and outer hamstring tendons. He could not bring the leg to a straight position even then on account of the rigidity of the parts, and for fear of tearing the contracted femoral vessels. The limb was dressed, and a double-inclined plane and extension-weights applied. The extension-apparatus slowly accomplished its purpose, but was somewhat hampered by the development of a small bed sore over the sacrum as a result of the necessity of keeping the man constantly on his back. This soon healed, and the limb was then more actively extended each day by increasing the weights.

As this extension at once eased and soon put an end to pain in the foot of the leg on which Dr. Keen had operated, it was thought well to treat the other limb in like fashion. This was done on June 19, 1894, with equally good results.

The surgical treatment closed with section of both gastrocnemial tendons on December 7, 1894. The patient has now no pain, and has gained from day to day and month to month in the straightening of the limbs, in moral courage, and in increasing freedom from nervousness.

Except for an attack of diphtheria, which necessitated removing the man to the Municipal Hospital, where he stayed from December, 1894, until January 22, 1895, he has been making constant improvement. His present state (February 4, 1895) is as follows:

A faint systolic murmur is heard over the apex of the heart and at the base. No circulatory disturbance exists. The lungs have cleared up. There is no cough or expectoration. The blood-count is 4,900,000. The hæmoglobin-value of the blood is 95 per cent., and the man looks ruddy. There is an absence of the neurotic facies. The muscles are less wasted, but firm, and respond well to the faradic cur-

rent everywhere, even in the legs. There are no tender spots on the body and there is no evidence of neuritis. The man controls his bowels and urine normally. There is no priapism or other abnormality of the genital organs. The weight to-day is $101\frac{1}{2}$ pounds, being a gain of only $6\frac{1}{2}$ pounds since admission to the wards.

There is still general emaciation, but the thighs and legs are somewhat more wasted than other parts of the body. There are to be seen the scars of the operations on the thighs and legs. There are no excoriations, no clubbing of the nails, or other evidences of trophic disturbance other than those caused by lack of use of the muscles.

The right thigh is in a straight line with the abdomen as the patient lies on his back. The leg can be extended to an angle of 170° with the thigh. The right ankle is perhaps a little extended, the toes being slightly flexed.

The left thigh is also in a straight line with the abdomen, as is the left leg with the thigh as the man lies passively on the bed. The ankle, foot, and toes are in good position.

Both thighs can be freely flexed, adducted, and circumducted, and there is the same voluntary control over the knees, legs, and ankles. The toes are less freely movable. The man walked five feet with the assistance of the nurse and a chair to-day. The grasp is good and equal, and no other motor palsy exists.

The patient has taken tonics, cod-liver oil, etc., and since September 17, 1894, he has had massage and movements with faradism daily to the affected limbs.

Early in April Dr. William J. Taylor divided the muscles on the inner side of both feet. This was needed because of the swelling and pain in the feet when the man was long afoot, and which seemed due to the cramped form of these parts.

On May 11, 1895, the man was walking a little on crutches and improving. After exercise the feet were

still more or less painful. He has steadily grown better up to this date (June, 1895).

The case, as you have heard it, does not enable us to be sure as to the immediate cause of the trouble. G. has been asthenic—neurasthenic, if you please; he recovers, goes South, and, as a railway clerk, is overtaxed and much worried. For ten days he has aches in the legs, and awakens at last with his legs drawn up.

Are these hysterical contractures? At first they could be relaxed under ether. Must we accept Charcot's dictum that this is a certain sign of their hysterical origin? There was probably some early loss of sensation, but if, as has been suspected, these spasms were due to a hemorrhage within or on the cord, we might well have had this symptom. I confess that there was too little disturbance to allow me to entertain the latter diagnostic theory. Here is a man who sleeps well and awakens with great and increasing contractions, and probably with more or less anæsthesia. In time the reflexes fail or lessen; the electric reactions are quantitatively diminished, and the mechanical reactions lost. All this might come from a neurotic, functional spasm, and it all reads like the progressive story of an hysterical disorder. It differs in no wise from the cases of Miss C. and Miss H., except that there are no other hysterical signals flying. Also in this (G.) case the reflexes have come back, the electric reactions are all better, and here and there we can call out movement by a blow with the hammer. At present G.'s legs are straight, or nearly so, and the muscles are all improving. Where and when these gains will end I do not know; but certainly so far, in the light of treatment,

the case does not read like one of organic disease of the cord, nor like any form of neuritis.

My conclusion is that in this case we have hysterical contractions in the adult male, a rare phenomenon, in this country at least, where we have the nervous temperament, but are not neurotic to the extent seen in the Latin races.

Fortunately, cases of general contracture are rare. But, whether general or local, if they have proved during four or five months amenable to no medical means, then I counsel the use of the knife and the section of tendons. It is true that Charcot and others have described cases in which, after years, contractions ceased abruptly and the limb was as before. The statement should have had a long appendix of exceptions. In cases of moderate contracture, not drawing the part to an extremely acute angle, sudden recovery may leave the joints undamaged; but in grave cases this never can be the case with joints like the knee, which is always the most difficult articulation to deal with. A long, violent contraction of the flexors partly luxates the tibia backward, and results in joint-changes which, after years of contraction, are incapable of cure.

In these knee-cases, perhaps in all articulations long out of place, there is probably soon or late more or less of that kind of inflammation which is also seen in joints too long on a splint. If this be so, a part of the quantitative failures to respond to electricity may be due to the muscular wasting so commonly observed in connection with damaged joints.

But, whatever the cause, I have seen hysterical contractions in which, after section of tendons, the joints were too much altered to admit of useful restoration.

The leg, bent at an angle of 45° , is brought, by section and the screw, to a much larger angle, but cannot be made straight enough for use. There is motion within limits, but with weak muscles and bent legs the effort needed for walking becomes excessive. Under these circumstances there may arise a question as to the propriety of making the leg straight by an operation that will leave it rigid. Above all, I wish to impress upon you finally that a long-contracted limb is not a limb to confide to the rare relief brought or not brought by time.

I desire to call attention to certain hitherto unnoticed clinical facts :

1. Two forms of hysterical contracture exist. One concerns single parts and limited groups of muscles. In this the contracture may last for years without the addition of organic changes in muscles, joints, or interstitial tissues. In this variety, or species, if you like, of the genus contracture, sudden cessation of the spasm is possible, or more probable than in generalized contractures.

2. Another form of contracture exists which attacks in succession one limb after another, until soon or late all or nearly all the voluntary muscles of the limbs, as well as those of the trunk, may become involved. The cases of this group do not, in my experience, ever get well abruptly. In them the muscles, joints, and areolar tissues undergo serious organic changes.

In the first or limited form the muscles and the muscular reflexes remain unaltered or are but little changed, and mechanical and electric responses continue to be normal or nearly so. In the second or generalized form the muscle-muscle-reflexes, such as knee-jerk, are

lost or mechanically interfered with late in the disorder, and the electric responses are quantitatively lessened, and may, in time, be almost altogether lost. It is only in this form, after years of life in bed, that we may expect to see changes in the cord. Whether these are merely independent accidents, or are the rare secondary products of the hysterical condition or of the organic changes this occasions in the peripheral nerves and muscles, we do not yet know.

In both forms we may expect to find loss in the sensory function of the skin, and more surely in the generalized contracture.

CHAPTER XVIII.

ROTATORY MOVEMENTS IN THE FEEBLE-MINDED.

MOST people, when seated, find some vague relief in change of attitude. Even when lying at rest in bed we still feel this need; long-continuance in one position seems to make it agreeable to alter it.

In some persons an excess of this tendency is shown in constant restlessness; with some, and especially among children, it exists remarkably during sleep. Certain persons incline to repeat one movement, and find, in so doing, the comfort most of us obtain from any change of posture. The frequent repetition of a movement may end in its becoming masterful, and finally the habit may gain almost despotic control.

The young are, naturally, the most liable to become the victims of such tricks of habit. If they are properly cared for as children, they soon unlearn these morbid ways; or, if uncared for, they may carry them into adult life.

The acts I refer to may be very simple movements, but sometimes they are or come to be complicated motions, the origin and continuance of which it is not easy to understand. I knew a man who carried out of childhood a curious habitual action. Always before sitting down he walked once around the chair. If by any chance he forgot to do so, he must rise and obey the impulse. He was ashamed of this habit, and would loiter and move about to conceal the action, but always

must at last go once around the chair. Another person, a woman, sat down only to rise, and sit, and so on, a dozen times before she could remain at ease.

Somewhere on the boundary line between voluntary and involuntary, or, rather, automatic acts, lie the movements seen in the disorder I named habit-chorea or, as others like to call it, habit-spasm. In this a child is subject to movements of one or another set of muscles, and these are more or less capable of control. It is a morbid condition, and usually curable.

Whatever the source of any of these movements, it is repetition which finally gives to them the power of a habit. At last to arrest such movement by force of will becomes difficult. A vast sense of relief arises when we yield to the tendency to repeat a habitual motion. Increasing discomfort attends upon the refusal to obey the habit-born impulse. I have seen a girl's arm tied to the waist by a mother resolute to break up the habit of rubbing the top of her head; a violent attack of hysteria followed.

In some cases the smaller, simpler habit-acts are more easy to overcome than are the larger and complicated movements, like the spinning habit.

If the whole range of these semi-automatic or impulsive movements is to be found in the ranks of the healthy, it seems obvious that in the mentally defective, a class indifferent to criticism and with less will-force at command, we should find them in their most despotic forms. Indeed, in the young of imperfect mind these habit-acts are apt very soon to become imperative. I fancy they are often semi-imperative from

the start, and are the offspring of suggestion or inherited instincts.

Among the defective who are found at Elwyn¹ are numerous illustrations of many varieties of the forms of movement of which I have briefly spoken. At present I desire to ask attention especially to the rare cases of Dervish movement, which I hesitate to describe as spasm without further knowledge of how far these acts were primarily irresistible or how far they have become so from frequent repetition. It is conceivable that in the slackly governed organization of a defective child these motor habits in which a certain pleasure is found may arise and dominate far more readily than in those of sound mind.

The cases I shall relate differ, and each must be studied by itself. I have myself seen elsewhere two cases of tendency to spin in which the children were in perfect health of body and mind; both were girls. When, in one of these cases, the mother realized that an ungovernable habit had been formed, the child, then about ten years old, was brought to me for advice. At first the girl had merely rotated until giddy, as many children like to do. Finding some satisfaction in it, she took to rotating when alone, and at last became remarkably expert. She confessed that she liked it, and would go where, unnoticed, she could spin unseen. By this time the habit had become so despotic that when kept with other and older people she would jump up of a sudden and spin furiously until she was forcibly stopped. When long controlled she became strangely restless, and, if allowed a minute's spin, seemed to be at once

¹ The Pennsylvania Institution for Feeble-minded Children.

comforted. This child was easily cured by a long stay in bed. There were no evidences of hysteria, and it was most unlike the case of hysterical gyration which I have elsewhere related.

Defective children or adults who rotate evidently derive a certain amount of enjoyment from their astonishing feats, whether the motion be the imperative result of organic disease or only a habit long undisturbed by disciplinary or other interference. There is also added the distinctive satisfaction obtained by the weak-minded when able to attract observation or to excite surprise.

CASE LXVII.—L. H., female, aged sixteen years, came to the Pennsylvania Training School for Feeble-minded Children from the almshouse. The maternal grandparents were intemperate. The father was also a drunkard and abused the mother before conception and during pregnancy. There are two other children living, a boy and a girl—the latter is an inmate of the Elwyn School; a sister died at eleven months in convulsions.

The patient was born at term; labor was normal. She was nourished at the breast three months by the mother, and then, strange to say, seven months by the maternal grandmother. She was a sickly baby, and had convulsions from the fifth until the eighth month of life, but has had none since.

In late childhood, but exactly when is unknown, Dervish spinning, as described below, appeared.

She is now a small, pale-faced child. No palsies, no atrophies. Teeth fair. No signs of septic taint. Heart and lungs normal. All bodily functions are performed normally. She has not yet menstruated. Her vocabulary is small and her speech is somewhat indistinct. She is active,

noisy, and heedless of danger. She is also nervous and restless. She is destructive and dangerous as to fire, and is apt to stray from the Home. She attends the school, and understands readily what is said to her and obeys

FIG. 17.



promptly, but her physical and mental restlessness is so great that she cannot improve much in school-work.

The station with eyes open or shut is good. Knee-jerk normal. The pupils are equal and react to light and with

accommodation. Sensation is normal, and there are no physical deformities. She has occasionally some involuntary twitchings of the face.

The most interesting symptom in her case is the habit of Dervish spinning. Many times daily she suddenly rises, walks to the middle of the room, rests upon one heel (usually the left one), the toes being raised, and then rotates, usually to the left, with extreme rapidity, her dress rising like the governor of a steam engine, as shown in Fig. 17; her arms are either clasped upon the chest or widely extended, and her right foot beats the floor to keep up the rotation. While spinning, her place on the floor changes but little; there is almost no forward, backward, or lateral progress. The duration of the spinning varies from fifteen minutes to a half-hour. There is usually no acceleration of her normal pulse (90) or of respiration (20). While rotating, her eyes remain closed. There is no evidence of vertigo. She is able after a half-hour's spin to walk away on a perfectly straight line. There is no evidence that she is under the influence of any imperative impulse, nor are the movements forced. It seems like a natural act. If in good humor, she will spin or cease to spin at command; if in bad humor, she will refuse to obey either request. When asked why she spins, she answers (and her intelligence is sufficiently to be relied upon) that she "likes it; it is fun." Her sister will, if requested, go through the same movements, but does them clumsily.

When seen by me after thirty minutes' spinning her pulse had risen from 90 to 115, but the respiration did not rise in like proportion. When asked to spin to the right she tries it, but is unable to do it with ease or as long as she is able to rotate to the left. The motion is so inconceivably rapid that two of us failed to count the rate of the spin.

CASE LXVIII.—H. F. was admitted to the Pennsylvania Training School for Feeble-minded Children from the almshouse on May 30, 1877, when five years of age. He was healthy when born, but at four months of age he fell twelve feet and had spasms from that time; occasionally they lasted for two weeks. The mother was born in Ireland; the father was a native of Philadelphia. There were two healthy children, younger than the one here spoken of. Paternal grandfather was insane.

The patient was small of stature, light weight, and a demi-microcephalic, an epileptic, and a mute idiot. He had general convulsions three or four times a month.

The boy is interesting or remarkable only for his automatism, which existed when he was admitted. At all times he was subject to odd motions of the hands, but periodically during the day he would give an exhibition of the habit, which has given him the name of "The Dervish." This began with tapping his chin with his left hand, delicately and rapidly, touching the fingers of his left hand to the wrist of the right, making two or three salaams, after which he began to gyrate from the left to the right. The right heel acted as a pivot, and the rotation was kept up by touches of the left toe or heel to the floor. The turns varied from three to seven, with intervals of a salaam or two between every set of rotations, and lasted for a long while. Fifteen minutes or more were thus passed before he darted away toward a window, where he remained a few minutes in a fixed or dazed state, from which he aroused to recommence his hand tricks, perhaps liking to stand on a broad belt of sunlight, so as the better to display his hand, which he watched with some appearance of enjoyment. He suffered from cataract of the right lens, and possibly partial amaurosis of the left eye.

A supplemental performance was to stand in one place

and throw the head and shoulders from side to side, describing with the forearm two-thirds of a circle, with the occiput set back as far as the neck would permit. In none of these performances was it thought that consciousness was abolished or suspended.

He seldom lost his balance and could walk very straight the moment he stopped spinning. He has been known to make 2000 revolutions in an hour.

In 1886 he seemed to be failing, and became too weak to spin. About this time he became almost blind—quite so in one eye. The only improvement noticed in the effort to train him was that his habits were more cleanly. His hearing was very acute. He could distinguish voices in a crowd when there was a great deal of noise, and he would respond when a familiar voice called him by name. His head was inclined almost constantly to the left. He seemed to have an idea of self-preservation, though he appeared oblivious of what was going on around him. He died in a spasm on October 14, 1890. The spasms were always unilateral, and alternated, first on the right, then on the left side.

Post-mortem examination. Body well nourished, skull normal, demi-microcephalic, scalp very thick. Dura mater so firmly adherent to the skull-cap along superior longitudinal sinus that the sinus was torn open on removing the bone. Right hemisphere fairly well developed and apparently healthy. On the left side the occipital lobe was entirely destroyed, as was also the left anterior one and part of the superior parietal and supramarginal lobe; a thick-walled cyst supplied their place. The left temporal lobe was hard, white, and shrunken. The remaining portions of the hemisphere exhibited the atypical arrangement of the convolutions often seen in brains where development has been interfered with very early in life. Hemi-

opia must in this case have existed since the origin of the lesion.

This case I never saw. I am indebted for the notes to Dr. M. W. Barr, the physician in charge of the Elwyn Asylum.

The motions were probably imperative, but even as to so plain a case of organic disease it is difficult to feel secure as to this point. It is not stated that, like the last case, the eyes were kept shut while he rotated, nor is the rate of motion given. It is said to have been very rapid.

CASE LXIX.—Male, aged thirty-two years. This man is a medium-grade imbecile. His station and gait are steady. Knee-jerks, pupillary and other reflexes are present. There are no sensory or motor disturbances. He is robust and works continuously under the guidance of an attendant. There is no deformity of head, spine, or extremities. The thoracic and abdominal viscera present no symptoms or physical signs of disease. Scars on the chest and back are suggestive of syphilis, but there are no distinct evidences of the condition. The tongue is clean and protrudes straight, and there are a few scars upon this organ, the result of injury during previous epileptic fits. His sight and hearing are good and he talks quite readily, but his answers to questions are somewhat incoherent and wandering. He seems of mild disposition, but is subject to outbursts of temper, which may come on abruptly. There are no fixed hallucinations.

When working or while eating he suddenly stands up and turns once around slowly; then he sits down or goes about his occupation with an air of apparent mental relief. He never turns to the right, and the motion was not reproduced at suggestion.

This patient is intelligent enough to tell me that he is unable to resist the impulse to rise and turn around as described. When asked to get up and turn he refused to do so ; but after a time, which was variable, he leaped up of a sudden, turned once, or even twice (which is rare), and then quietly resumed his work. Occasionally while walking he executes the same single rotatory motion, and then moves on as before.

INDEX.

- A** LLEN, PROF., operation by, 258
- Anæmia, pernicious, 133, 142
- Anæsthesia, hysterical, 281
psychic, 17
- Anatomy of sciatic tract, 159
- Anhalonium*, symptoms of, 61
- Anosmia, 19
- Anxiety of præ-dormitium, 67
- Arthritis in hemiplegia, 146
in hysterical disease, 287
- Ataxia, cerebellar cause of, 130
Gowers on, 131
hysterical, 142
on awakening, 87
motor, in a child, 125
muscle sense in, 137
pernicious anæmia and, 133
retained reflexes in, 137
- Aura, visual, 84
with sensory shocks, 81
- B** AILLARGER on hallucinations of præ-dormitium, 60, 61
- Ball, Dr. M. V., 32
- Barr, case by, 298
- Bennett on sensory auras, 83
- Blindness, hysterical, 253
psychic, 15
- Blood-letting in melancholia, 47
- Briquet on hysterical ataxia, 141
- Bromide causing homicidal impulses, 63
- Burr, case by, 182
on local temperature-changes from position, 207
post-mortem notes by, 143
- C** ATLIN on relation of pain to weather, 162
- Childbed causing sciatica, 157
- Chorea, eye-examination in, 227
hysterical, 94
in sleep, 85, 86, 87
of habit, 96
on waking, 87, 89
- Clark on eye-strain, 224
- Cold-sensations, cases of, 115-117
causes of, 111
classification of, 107
from neuritis, 120
of cauda, 117
hysterical, 122
in buttocks, 112, 113
intensified capacity to feel, 121
Mills on, 124
of central origin, 108, 111
Putnam on, 123
subjective, in peripheral neuritis, 112
with elevation of temperature, 113, 117
with unchanged temperature, 112
- Color-fields in hysterical paraplegia, 35, 75
normal, in hysteria, 270, 282
reversal of, 106
- Contracture, hysterical, 242, 275
anæsthesia in, 261, 266
cases, 249, 275, 279
differing forms of, 246, 288
ending in sclerosis, 243
multiple, of hysteria, 244
painful, 281

Contracture, probably not spinal
 in origin, 243
 reflexes in, 245
 reflexes absent in, 266
 resembling poliomyelitis,
 246
 Richet on, 247
 symptomatology of, 243
 tenotomy for, 248, 284
 Cooper, Sir Astley, 110
 Cuba, seasonal melancholia in,
 43
 Curvature, spinal, with insanity,
 210
 cases, 212, 215, 216

DAY-NUMBNESS functional, 68

Deafness, hysterical, 253
 Derby on eye-strain, 221
 De Schweinitz, eye-examination
 by, 20, 96, 138, 190, 214
 eyes in chorea, 227
 on sleep-ptosis, 77, 78
 Diaphragm, spasm of, in hys-
 teria, 253
 Dyer on eye-strain, 221
 Dysæsthesia on waking, 70
 Dyschromatopsia, hysterical, 75,
 106
 in hysterical palsies, 36
 J. K. Mitchell and de
 Schweinitz on, 36

EPILEPTICS, eyes of, 227

Erythromelalgia, 177
 blood-pressure in, 195
 cases of, 178, 181, 185,
 197
 compared with Ray-
 naud's disease, 179
 incurability of, 190
 morphia in, 197
 surface-temperature in,
 197
 with gangrene of foot,
 197
 with sciatica, 172

Examination, post-mortem, of
 spinning case, 297

Eye-strain as cause of headaches,
 220

Eyes in chorea, 227
 in epilepsy, 227

FAILURE, respiratory, in sleep, 91

Feeble-minded, rotatory move-
 ments in, 290

Féré, cases by, 73, 75

Foot-fidgets, 86

GERHARDT on erythromelal- gia, 180

Glycosuria in melancholia, 51

Gowers on ataxia, 131

HABIT-CHOREA, 96

diet in, 98

eyes in, 227

treatment of, 98

Hall, Dr. P. S., post-mortem
 notes by, 203

Hallucinations of præ-dormitium,
 62

Headaches and eye-strain, 220

Heat-sense, loss of, 266

Hemianopsia, hysterical, 20

Hemiplegia, arthritis in, 146, 150
 nocturnal, 68

node in, 150, 151

nodes following, 145, 149

pain as a prodrome of, 143

as a sequel of, 143

subjective coldness in, 111

Hewson on anatomy of sciatic
 tract, 159

Hip-disease simulating sciatica,
 158

Hurd on recurrent melancholia,
 42

Hyperæsthesia. hysterical, 276

Hypnotism in melancholia, 34

Hysteria, anaesthesia in, 281

ataxia of, 87, 142

contracture in, 242, 279

multiple in, 244

dyschromatopsia in, 35, 75,
 106

eyes in, 35, 75, 106, 270, 282

Hysteria, myoclonus in, 99
 sclerosis following, 248
 sensations of cold in, 122
 with locomotor ataxia, 133

IMPULSE, homicidal, due to
 bromides. 63

in melancholia, 46

Insanity, relation of præ-dormi-
 tium to, 59

Insomnia from eye-strain, 223

JACKSON, Professor Samuel,
 on recurrent melancholia,
 55

on respiratory failure in
 sleep, 91

Joints, post-hemiplegic disease
 of, 148, 150

KEEN and Morehouse on pain-
 misreference, 233
 operation by, 192, 270, 284

Kinnicutt, case by, 120

Knee-jerk, in ataxia, 131

in sclerosis, 132

reinforcement of, 132

Krafft-Ebing, melancholic hyp-
 notized by, 34

LANNOIS on erythromelalgia,
 179

Leg-pain in sleep, 79

MELANCHOLIA, abrupt re-
 covery in, 26, 37

bloodletting in, 48

caused by dream, 50

during digestion, 51

effect of menstruation on, 44

heredity in, 28

inter-menstrual, 47

case of, 44

irregular recurrent, 53

menstrual, 44, 46

of post-dormitium, 49

predisposing causes, 27

recurrent seasonal, 32

Melancholia, recurrent seasonal,
 cases of, 32, 36, 37, 39, 40

related to sleep, 49

removal of ovaries in, 45

sensory delusions during post-
 dormitium, 49

tends to recur, 31

treated by hypnotism, 34

with erotic impulses, 45

with glycosuria, 51

with homicidal impulse, 46

Melancholics, marriage of, 29

Mills on cold-sensations, 124

Mind-blindness, 15

Misreference of pain, 231

Mitchell, J. K., and de Schweinitz
 on dyschromatopsia, 36

Mitchell, J. K., on misreference
 of pain, 234

joint-lesions from spinal in-
 juries, 145

Morton, operation by, 159, 202

Movement-rate in ataxia, 138

Movements, imperative, 291

rotatory, 290

spinning, 292, 293, 296

Myoclonus, multiple, 99, 100

Muscle, pyriform, share of, in
 producing sciatica, 160

-sense in ataxia, 137

NAUSEA from eye-strain, 223

Neuritis as a cause of ery-
 thromelalgia, 181, 194,
 196

changes of thermal sense
 in, 120

cold-sensations in, 112,
 117, 120

sciatic, 155

terminal, 194

Neuroses, ocular, 220

Nodes following hemiplegia, 145,
 149, 151

Numbness, hysterical, 73

OCULAR neuroses, 220

Olfaction, loss of, 19

Ormerod on numbness, 72

- PAIN** and weather, Catlin on, 162
 as a prodrome of hemiplegia, 145, 147
 Pain as a sequel of hemiplegia, 147
 misreferred, 231
 cases, 231, 233, 234
 Paralysis from irritation, 76
 hysterical, 266
 Paraplegia, hysterical, 35
 Paresis, nocturnal, 68, 72, 75
 Pearce on local temperatures, 207
 Pershing, case by, 15
 Pinel on seasonal melancholia, 42
 Post-dormitium, 59
 relation of, to insanity, 59
 sensory delusions in melancholia, 49
 Præ-dormitium, Baillarger on, 60
 hallucinations in, 62
 olfactory disturbance in, 62
 relation of, to insanity, 59
 sensory shocks in, 83
 terrors in, 65
 Pregnancy, delusion of, in the insane, 239
 spurious, 236
 Prentiss on physiological effects of *anhælonium*, 61
 Pseudocyesis, 236
 cases, 236, 237, 238, 239, 241
 causation of, 239
 Hirst on, 238
 sympathetic vomiting of husband in, 241
 vomiting in, 238
 Ptosis of sleep, 77
 Putnam on cold-sensations, 123
- RANNEY**, on eye-treatment of epilepsy, 228
 Raynaud's disease, case of, 178
 compared with erythromelalgia, 177, 179
 Reactions, faradic, in hysterical paralysis, 278, 279
 Reaction-time in ataxia, 138, 139
 Reflex ocular neuroses, 220
 Reflexes retained in ataxia, 128
- Reinforcement of knee-jerk, 132
 Richet on contractures, 247
 Rigidity, hysterical, on awaking, 90
 Rotation, imperative, 298
 Rotatory movements, 290
 cases of, 293, 296, 297
- SAUNDBY** on sleep- numbness, 68
 Schüle, on recurrent melancholia, 43
 Sciatica, 154
 and erythromelalgia, 172
 cases of, 169, 170, 171
 childbed, 157
 diagnosis of, 154
 double, 170
 from fecal accumulations, 156
 from pelvic growth, 156
 from pressure during delivery, 156
 from tumor, 159
 hours of exacerbation, 161
 influence of position on, 158
 of central origin, 175
 pyriform muscle's share in, 160
 simulated by hip-joint disease, 158
 treatment of, 164
 bandage, 166
 blisters, 167
 cautery, 167
 cocaine, 165
 dry cups, 165
 ice, 167
 massage, 167
 morphine, 165
 nerve stretching, 175
 splint-rest, 165
- Sciatic nerve, anatomy of, 159
 Sclerosis, knee-jerk in, 132
 post-hysterical, 248
 Sensory shocks, 80
 Sharkey on misreference of pain, 232
 Shocks, auditory, 81
 and sensory, 81

Shocks, olfactory, 81, 83
 sensory, 80, 81
 in daytime, 83
 visual, 81
 Sinkler on numbness, 72
 Sleep disorders, 58
 -jerks, 85
 -numbness, 68
 in neuritis, 71
 with pain, 71
 -pain, 79
 -ptosis, 77, 78
 respiratory failure in, 91
 -shocks 80, 82
 double auras in, 84
 præ-dormitium, 80
 olfactory, 83
 aura in, 84
 visual aura in, 84
 Smith, Dr Andrew H., on sleep-
 numbness, 68
 Spasm, tonic, on waking, 89, 90
 Stevens on refractive lesions, 225
 Surface-temperatures, 205, 207
 Starr, case by, 37
 Syphilis, sciatica due to, 156

TAYLOR, J. M., case by, 169
 170
 on anomalous sciatic
 nerves, 159
 W. J., operation by, 285
 Temperature, difference of, on two
 sides, 206
 influence of position on, 207

Tenotomy for hysterical contrac-
 ture, 272
 in ocular neuroses, 229
 Thermometer for surface-temper-
 atures, 205
 Thermometry of erythromelal-
 gia, 201
 Thomson on astigmatism causing
 headache, 226
 A. G., eye-examinations by,
 128, 267, 282
 Tobacco causing sleep-jerks, 86
 -shocks, 82
 Tyrell on eye-strain, 224

UREA lessened in acute melan-
 cholia, 56

VASO-MOTOR paralysis of ex-
 tremities, 177
 Vertigo from eye-strain, 223
 Vomiting, sympathetic, in hus-
 band, 241
 Visual-fields in hysteria, 36, 75,
 106

WAKING-NUMBNESS, 70
 cases of, 72, 75
 following nerve - freez-
 ing, 71
 Waking tonic spasm, 89
 Weather and pain, 162
 Witmer on reaction-time, 138

